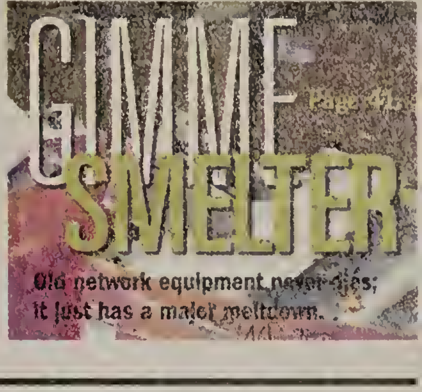
JULY 6, 1998 VOLUME 15, NUMBER 27

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



Old network equipment never dies; it just has a major meltdown.

IP UPDATE

IP voice quavers

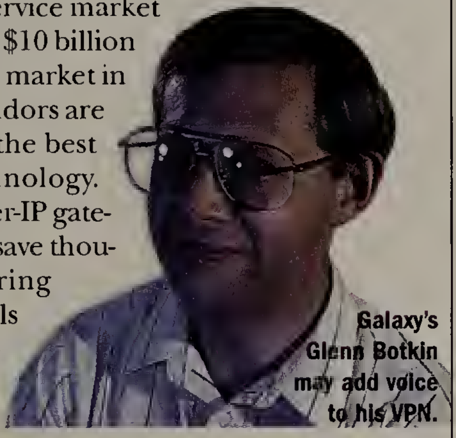
By Denise Pappalardo

Hype, hesitation and hope. Three words that best define the voice-over-IP market today.

Business users brave enough to weed through the marketing hooey and nascent promises are finding that IP telephony works. But other users remain skeptical.

While the voice-over-IP service market is expected to be worth over $10 billion by 2002, it's still very much a market in flux. Users, carriers and vendors are trying to figure out what's the best application for the technology. Pioneering users of voice-over-IP gateways say the technology can save thousands of dollars on recurring long-distance telephone bills by making existing bandwidth more cost-effective.

See **Voice over IP**, *page 59*



Galaxy's Glenn Botkin may add voice to his VPN.

MARK ESCHER

Just the IP fax, ma'am

By Tim Greene

Using the Internet instead of the public phone grid to deliver facsimiles can take a big bite out of long-distance fax bills, offering huge savings that corporate IS managers are just starting to recognize.

Deploying an IP fax service can save 30% to 70% on international fax calls, depending on what country the fax goes to, experts say. And international faxing within a corpora-

See **IP fax**, *page 59*

Tough road for Java shrink-wrap

Packaged applications face marketing, retail and business hurdles.

By Chris Nerney

Every day, it seems, some eager start-up or established player announces a new Java software product. This year alone, nearly 500 Java applications and development tools were added to a list of Java products compiled by Sun Microsystems, Inc.

But while the number of commercially available products continues to grow, the Java software market is hamstrung by several problems, which include:

- Overall confusion over what products are available, what they do and how to get them.
- Uncertainty over the future of many software developers, especially smaller independent software vendors (ISV).
- A much smaller selection of software compared to what's available for Windows, Unix and Macintosh platforms.
- The lack of a retail presence for commercial applications.
- Ineffective marketing compared to leading Windows applications.

Users can go to Sun's Java

See **Java**, *page 60*

Andreessen *says*

Netscape guru Marc Andreessen believes the client-side Java situation is "pretty grim." Page 60.

Thin clients hit Web barrier

By John Cox

Running remote Windows applications from a browser is one of the most appealing qualities of Windows NT Server 4.0, Terminal Server Edition (TSE). Theoretically, companies could let not just employees, but also business partners and customers, access applications on TSE servers through browsers.

See **License**, *page 61*

MORE ONLINE

- **A review of TSE and MetaFrame**
- **An online forum to debate the merits of thin clients from Microsoft and others**

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Pay as you go for frame relay

Usage-based pricing can save you money while improving reliability and performance.

SACHA ECKES

By Steven Taylor

Usage-based pricing isn't a well-known frame relay option, but it's one that could save you money while providing more redundancy. Ultimately, it could change the way users think about how they configure frame relay nets.

With traditional frame relay pricing, you pay for each frame relay connection, making it costly to construct a meshed network that has at least one direct path between any two sites. Under a usage-based plan, the bulk of your charges are based on how much traffic you transmit, so it can be more cost-effective to construct a fully meshed network that will give you better performance and more reliability.

See **Feature**, *page 38*

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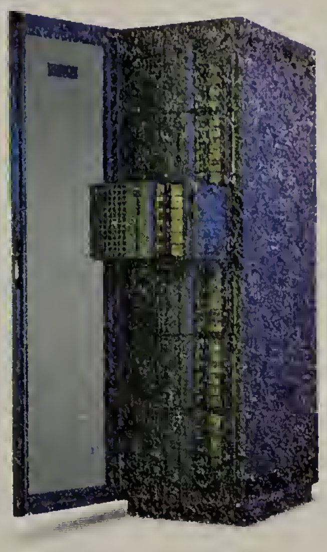

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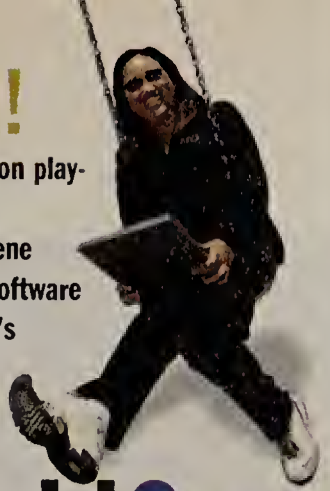
VIRTUAL LAW

Warren Prince, president of Prince Law Offices, has created a virtual law firm where attorneys send communications remotely over a frame relay net. Page 27.

PLAY TIME!

Most managers frown upon playing computer games on company time, but Charlene Vaughn, a partner with Software Investment Corp., says it's therapeutic. Page 47.



DAVID BUTOW

SHINY, HAPPY NETS

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Users say they are pleased with IP as an access tool, but not much else. Page 24.

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JASON GROW/SABA

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This Week

Only on Fusion

Novell. For the past couple of months, we've run a forum on NetWare vs. NT. Many loyal NetWare users have chimed in with complaints about Novell marketing. But what makes them so loyal? We've set up a forum to discuss your NetWare success stories. **DocFinder: 7850**

Name that Toon 3. We've put up another captionless Teletoon. Can you come up with a witty riposte or bon mot to fill the empty space? There's a customized Teletoon T-shirt in it for you if our distinguished panel of experts (OK, a bunch of *Network World* editors) picks yours as the winner. **DocFinder: 7851**

Hiring. Do some companies expect too much for the salaries they're willing to pay IS professionals? Join our discussion on overly optimistic (or cheap?) help-wanted ads. **DocFinder: 7853**

Voice over IP. After you read this week's Page One story, come online for a quick voice-over-IP poll. Let us know what your plans are, then see how other Fusion users have voted. **DocFinder: 7736**

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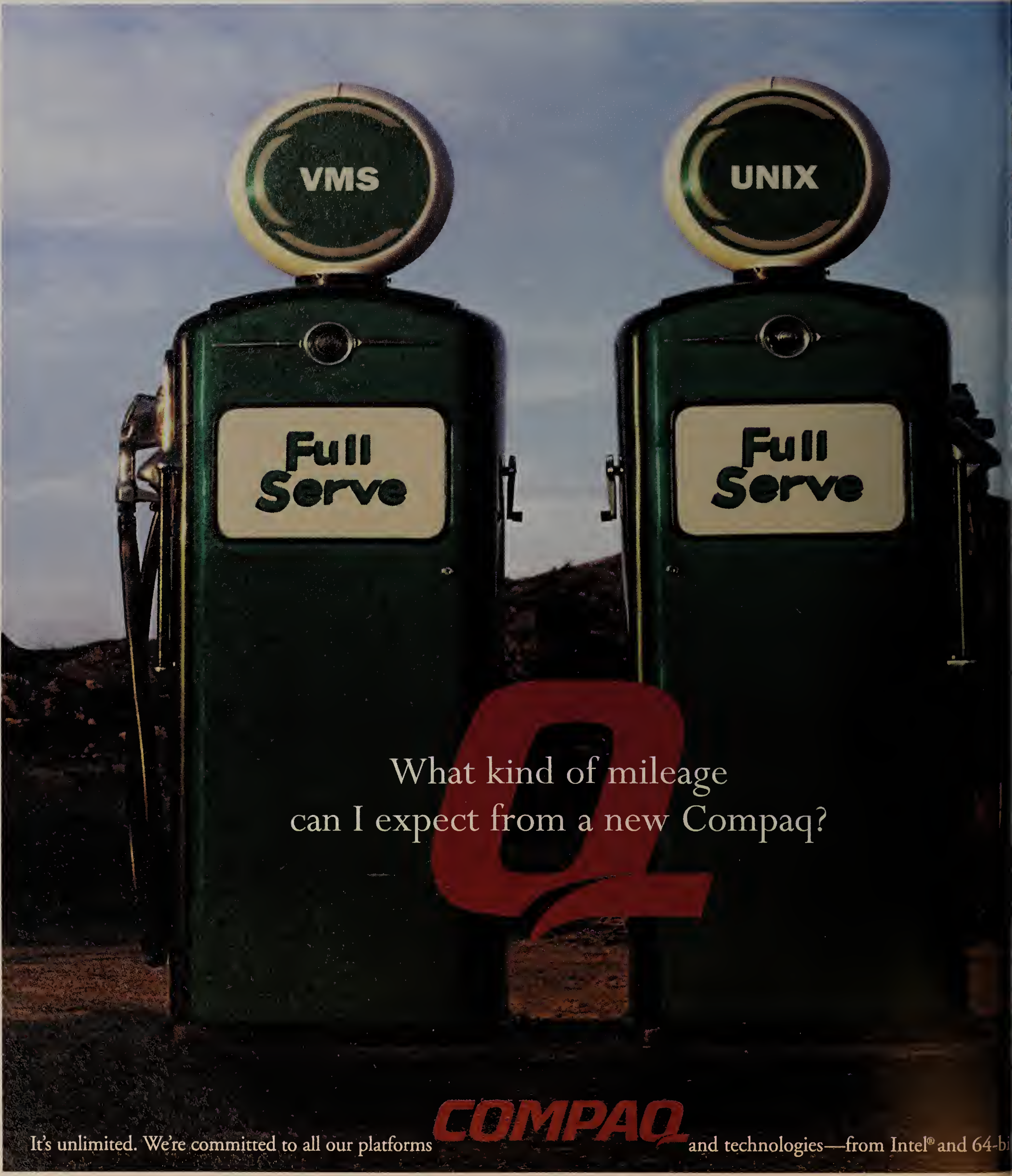

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News briefs, July 6, 1998

Sun consolidates Java server market

Sun Microsystems, Inc. last week announced it will purchase Java server middleware vendor NetDynamics, Inc. for an undisclosed amount. The purchase ended months of speculation that NetDynamics, once a leader in the Java applications server market, was looking for a buyer. Based in Menlo Park, Calif., the 3-year-old company's sales reportedly sagged last year as start-ups such as WebLogic, Inc., Novera Software, Inc. and SilverStream Software, Inc. launched competing products.

Skepticism about cable telephony haunts AT&T

With AT&T stock down 14% since the carrier announced it will acquire cable TV company Tele-Communications, Inc., AT&T officials last week unveiled their strategy to turn TCI facilities into two-way residential telephony and Internet access lines. AT&T, Cisco Systems, Inc. and other vendors are developing IP-based switching systems for cable originating points, the equivalent of local exchange central offices, according to AT&T Chief Technology Officer David Nagel. The price for the switching systems: $1.3 billion, plus an equivalent amount for maintenance. AT&T customer business sites are still expected to rely mostly on broadband-ready fiber facilities from Teleport Communications Group, Inc. (TCG). AT&T announced last January that it would acquire TCG; the deal is expected to close this summer.

The trouble with trademarks

Microsoft Corp. last week agreed to pay $5 million for the rights to the Internet Explorer name, settling a trademark lawsuit filed by the developer of another browser with the same name. Microsoft will pay the money to Dhiren Rana, founder of SyNet, Inc., a Chicago ISP that went out of business last year, and other trustees of the defunct company. SyNet began distributing its Internet Explorer browser in late 1994 and sued Microsoft in October 1995. For $5 million Microsoft gets SyNet's interest in the Internet Explorer name, a trademark registration in Illinois and Rana's current trademark registration that is pending in the U.S. Patent and Trademark Office. Meanwhile, IBM is facing a logo battle. A start-up called E Technologies Associates LLC asserts that it owns the "e-business" logo that IBM uses for its line of Internet business applications and services. E Technologies claims it used the lowercase "e" symbol, which looks like the symbol @, more than a year before IBM used it. The dispute will play out in U.S. and European courts.

ATM bygones

FORE Systems, Inc. and MMC Networks, Inc. last week announced a cross-licensing agreement to enhance their respective ATM products. The agreement also brings to a close FORE's impending legal action against MMC, which asserted that MMC was infringing upon several of FORE's patents and trade secrets. The patents enable high-performance traffic management on a per-connection basis, also known as per virtual connection queuing. The two companies have agreed to cross-license current and future technology developments from one another.

Netscape stock on the rise amid partner talks

The price for Netscape Communications Corp. stock hit its highest point in eight months following reports that the company is talking to U.S. media companies about providing content to Netscape's Netcenter site. Netscape's stock closed last Thursday at 41 5/16, having gained more than 14 points last week.

Compaq boosts Web-based enterprise management app

Company touts Insight Manager as compliant with emerging Web mgmt. standard.

By Robin Schreier Hohman

Houston

Compaq Computer Corp. last week claimed that the new release of Insight Manager server management software is a Web-based Enterprise Management (WBEM)-compliant product. But that claim stretches the truth a bit.

WBEM is a standard that defines a way to manage enterprise network resources using Web-based and other Internet technologies. WBEM backers expect it to generate a new breed of tools for reducing the cost and simplifying the task of enterprise network management.

WBEM, announced in 1996 as a joint effort backed by BMC Software, Inc., Cisco Systems, Inc., Intel Corp., Microsoft Corp. and Compaq, has since garnered the support of more than 70 other vendors. But products conforming to WBEM have not made a stampede to market.

One of the core components of WBEM is Common Information Model (CIM). CIM describes management data in a standard format for interoperability in a heterogeneous network. However, CIM is very much a work in progress. It could be two years before a fully populated CIM is released.

Compaq moves ahead

Instead of waiting for CIM, Compaq populated the new version of Insight Manager, Insight Manager XE, with data from its own management agents and third-party SNMP Management Information Base-2 and Desktop Management Interface (DMI) Version 2 agents, according to Ed Reynolds, director of product planning for the management solutions business unit at Compaq. The transition to the WBEM CIM will not be difficult, he said.

Steve Foote, senior vice president of Hurwitz Group, Inc., a consultancy in Framingham, Mass., agreed it's not necessary to wait for CIM before releasing WBEM-compliant products.

Insight Manager XE marries Compaq's agent data and third-party agent information to the Insight Manager database, which in turn pops the information into a Web browser. "You wind up with an interface that provides you with all the information you need to understand what's going on in your environment," Foote said. Currently, Insight Manager XE supports Microsoft's Internet Explorer, but Compaq plans to support Netscape Communications Corp.'s Navigator in the next few months.

Security issues abound

Foote cautioned that because users can access desktops and databases across an intranet or the Internet, security has to be beefed up before users feel secure with WBEM.

Compaq is the second company to introduce WBEM-compliant products. In May, Tivoli Systems, Inc. demonstrated WBEM-enabled Tivoli NetView 5.1 software, which began shipping this month.

Also in May, Compaq announced WBEM-enabled agents that reside on Compaq servers and clients and gather information such as seek time, hard disk revolutions per minute and temperature.

Compaq's Server Management Agents run on Compaq's ProLiant and ProSignia servers running Windows NT 3.51 or 4.0; Novell Inc.'s NetWare 3.12, IntranetWare 4.11 and 4.12, IntranetWare for Small Business, and UnixWare 2.12 and 2.13; The Santa Cruz Operation, Inc.'s OpenServer 5.03 and 5.04; and IBM's O/S 2 Warp 4.0.

Compaq Desktop Management Agents work on Compaq Deskpros running Microsoft Windows NT Workstation 3.51 and 4.0, and Windows 95 and 98.

3,000 beta testers

Insight Manager XE will be made available to about 3,000 beta testers between now and October.

Compaq expects to release a final version of Insight Manager XE by year-end.

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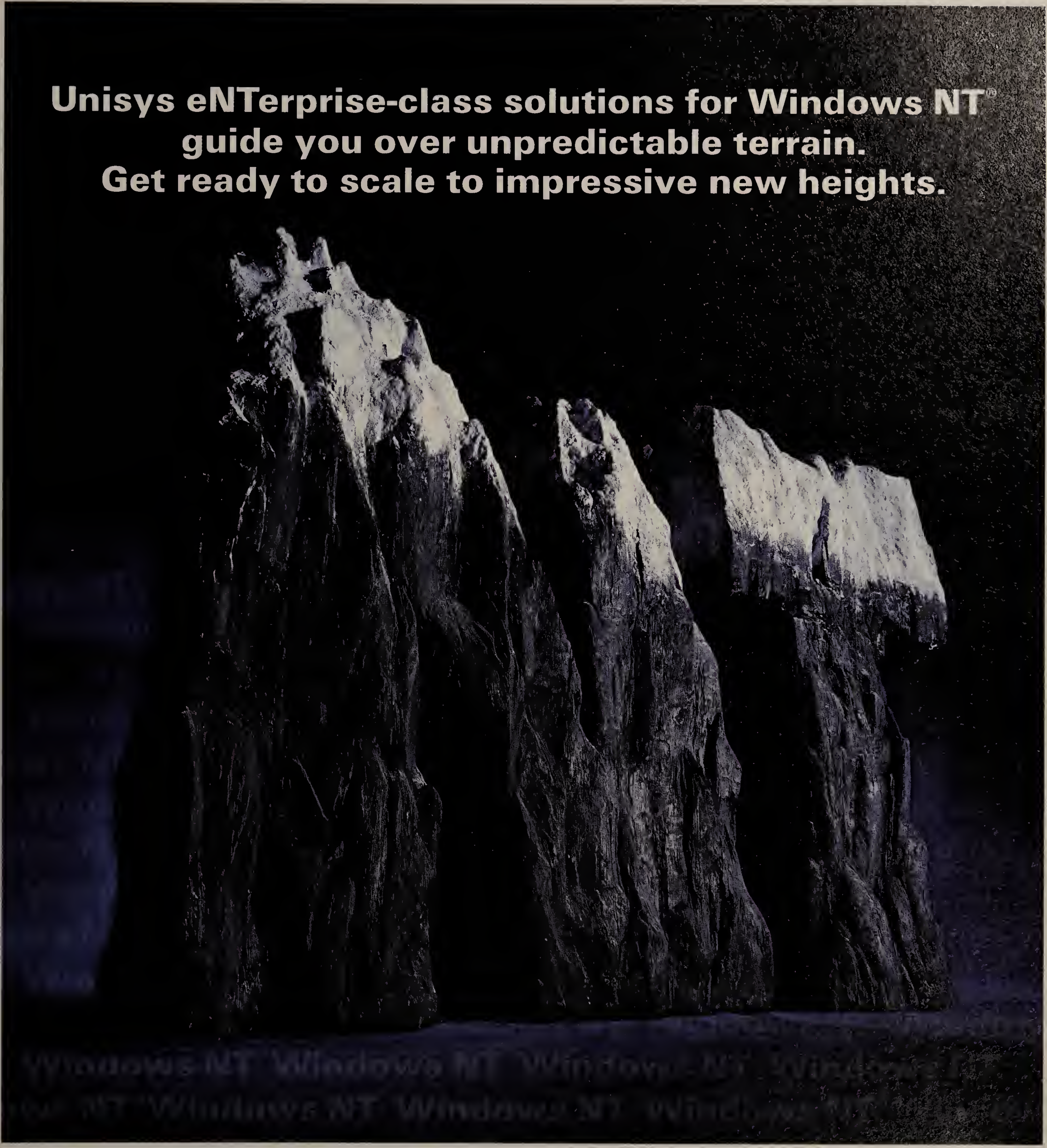
COMPAQ BRINGS INSIGHT TO NEW STANDARD

Standards that Insight Manager XE supports:

- **CIM:** An implementation-independent, object-based data model for management information.
- **MIB:** A detailed definition of data accessible by a network management protocol.
- **MIB-2:** The second generation of MIB; is able to monitor more objects than MIB.
- **Remote Monitoring (RMON):** A protocol that uses SNMP to gather information from net devices.
- **RMON-2:** An RMON standard that gathers information at the network and application layers. It augments, but doesn't replace RMON, because it doesn't include MAC-level monitoring.
- **SNMP:** The standard protocol for gathering device information for end-to-end enterprise network management.
- **SNMPv2:** The second-generation SNMP, which has added security and management capabilities.
- **WBEM:** A standards initiative led by Compaq, Microsoft, Cisco, BMC Software and Intel to marry enterprise management with Web technology.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Return receipts rankle e-mail users

Invasion of privacy charges raised, though some consider it a non-issue.

By Paul McNamara

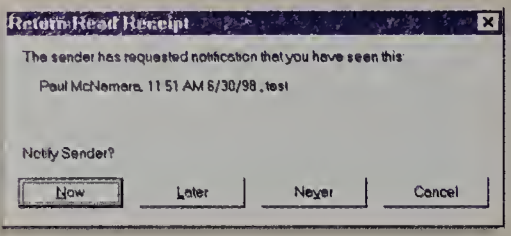
Keep your nose out of my in-box.

That's what critics of e-mail return receipts and read-status notifications say to senders who just have to know immediately whether their message reached its destination and was opened.

Those who object — a minority, by most accounts — claim these features are an invasion of privacy. Of particular concern, they say, are those instances where less-savvy recipients remain unaware that their e-mail software allows a sender to know if and when a message has been read.

BEEFS WITH E-MAIL RECEIPTS

Critics of e-mail return receipts and disposition notices count these among their gripes:



Return Read Receipt

The sender has requested notification that you have seen this:

Paul McNamara, 11:51 AM 6/30/98, test

Notify Sender?

- ☑ They are an invasion of privacy.
- ☑ They subtly pressure recipients to act on the sender's timetable.
- ☑ They generate excess network traffic that is often of limited value.
- ☑ They are unreliable when interacting with disparate e-mail products.

Critics do more than just gripe, too. Some deploy elaborate countermeasures designed to repel a sender's automatic message tracking attempt, or, in cases where an on-screen option is presented, simply refuse all requests for receipts.

"People think it's tacky to sort of spy on [recipients] and ask them to tell that they've read a message before they've actually replied," said Paul Hoffman, director of Internet Mail Consortium.

Tacky or not, these message disposition notifications are likely to become more commonplace.

The Internet Engineering Task Force (IETF) currently has on standards track a Message Disposition Notification specification, which, if widely adopted by vendors, will enable reliable end-to-end message tracking across the Internet. Right now, the "Was my message read?" capability is largely limited to homogeneous mail environments.

Meanwhile, opinions vary greatly on whether these status notices are necessary.

"E-mail is supposed to look like the rest of your business communications," Hoffman said. A sender of a business letter or fax, for instance, doesn't usually ask to know if it is read, but instead simply waits for an answer.

Subtle pressure to reply immediately, whether intended or not, drives some e-mail administrators and end users to devise countermeasures.

"I personally disable return receipts so I can read a message and [reply later without] the person knowing I read it and haven't answered," said Chris Miller, systems manager at Washington University School of Medicine in St. Louis. "I use an agent that resets the 'flag' of a return receipt to null so it doesn't generate one."

Lotus Notes and Domino would allow him to disable return receipts systemwide, but requests for the features from users keep him from going that far, Miller added.

Critics of return receipts say the "message undeliverable" warnings generated by routers and message transfer agents are a far more reliable measure of whether an e-mail found its mark.

"By virtue of [an undeliverable warning] not showing up on your doorstep, you can assume very confidently that that mail item got delivered," said Mike Harer, a messaging product manager for Lotus Development Corp.

The emerging IETF standards work should pay off on two scores, according to Harer: Senders will get the end-to-end disposition reports they crave, while those who find such notices objectionable will likely get more granular ways to opt out.

"Now we [will be] into the realm where we are respecting organizational policies" by giving administrators more control, Harer said, adding that faithful implementations of the standards will be key. "[Vendors] can't all do it in a different proprietary fashion and expect end-to-end interoperability."

In the meantime, tension between anxious e-mail senders and reticent e-mail recipients will continue. So, too, will the cat-and-mouse games.

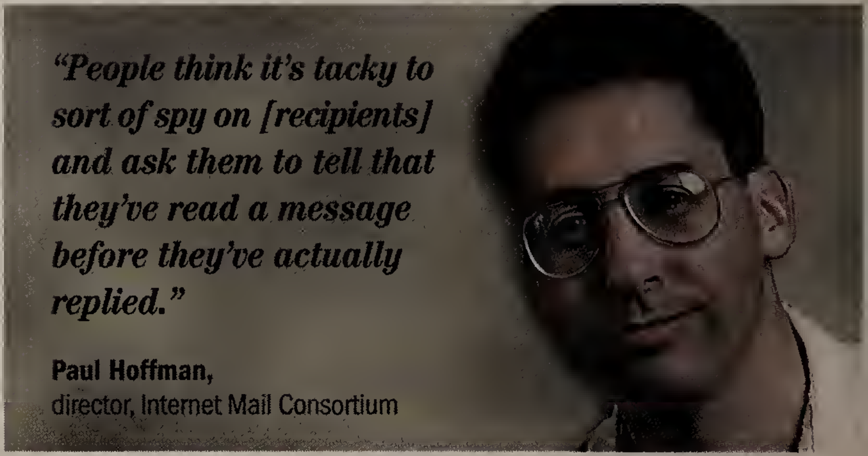
Novell, Inc.'s GroupWise has a status-tracking feature that company officials said is popular because it lets senders see what happened to a message by accessing that message's server-based properties page. No separate e-mail return receipt is generated.

"It's really odd how people use that status tracking," said John Gailey, director of Novell's collaboration services group. For example, he cited a worker who uses the feature as a reconnaissance tool.

"She will send [her boss] a message for the sole purpose of looking to see if he is in his office," Gailey said. "She gets the message that he's there, then she shows up at his door."

Of course, there are those who believe the critics of such technologies are making much ado about nothing.

"I can't believe that this is an issue," said Jim Santiago, a network executive at Boston-based AEW Capital Management, LLP. "In all my years in information systems, I have never heard of anyone complaining about return receipt." ■



"People think it's tacky to sort of spy on [recipients] and ask them to tell that they've read a message before they've actually replied."

Paul Hoffman,
director, Internet Mail Consortium

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This week's question:

AT&T last month announced plans to buy cable giant Tele-Communications, Inc. Which carrier tried to merge with TCI in 1994?

Microsoft explains away NT delay

By John Cox

Microsoft Corp. jolted some customers last week when it announced there would be a third beta release of Windows NT 5.0, prompting widespread speculation and reports that the operating system's release would be delayed until mid-1999.

Not so, Microsoft said. In fact, company officials maintained that NT 5.0 is still on the same schedule. All that's changing is the name of a scheduled "interim" release of the NT 5.0 beta code, insisted Mike Nash, director of marketing for Windows NT Server.

Here's how Nash explained the change: In May, Microsoft said it would delay the release of the Beta 2 software from the first half of 1998 to sometime this summer. At the company's recent Tech Ed conference, NT 5.0 managers said the software would be released six to eight weeks after Tech Ed, which would mean before the end of July.

In keeping with past practice, after Beta 2 ships Microsoft will continue to release "interim builds" of the software, including one called Beta 2 Refresh, which will be a more thoroughly tested version of the beta code that is sent to a selected group of customers. "But [Beta 2 Refresh] sounded confusing, so we changed the name to 'Beta 3,'" Nash said.

When Beta 2 ships to some 200,000 customers, it will be "feature complete," according to Nash. That means it will have every new feature Microsoft has promised, including Intellimirror technology, Active Directory and plug-and-play capability.

There will even be a bonus: Beta 2 also will have the multiuser terminal server capability that's just now being released as Windows NT Server 4.0, Terminal Server Edition. "The terminal services will be there, but they will need more work to be finalized and tested, because they were added late in the process," Nash said.

At this stage, Microsoft is not planning to change any of NT 5.0's key features, Nash said.

"No shipment date has been announced for NT 5.0," Nash said. "Beta 3 should not affect the shipment schedule because it's simply a renaming of the Beta 2 Refresh. And the refresh has always been part of the development plan." ■

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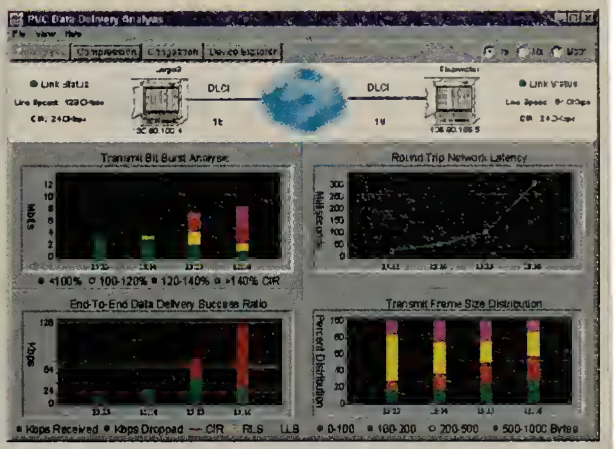
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Mbits
<100% ○ 100-120% ● 120-140% ○ >140% CIR
Round Trip Network Latency
Milliseconds
End-To-End Data Delivery Success Ratio
Kbps
Kbps Received ● Kbps Dropped — CIR RLS LLS
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Percent Distribution
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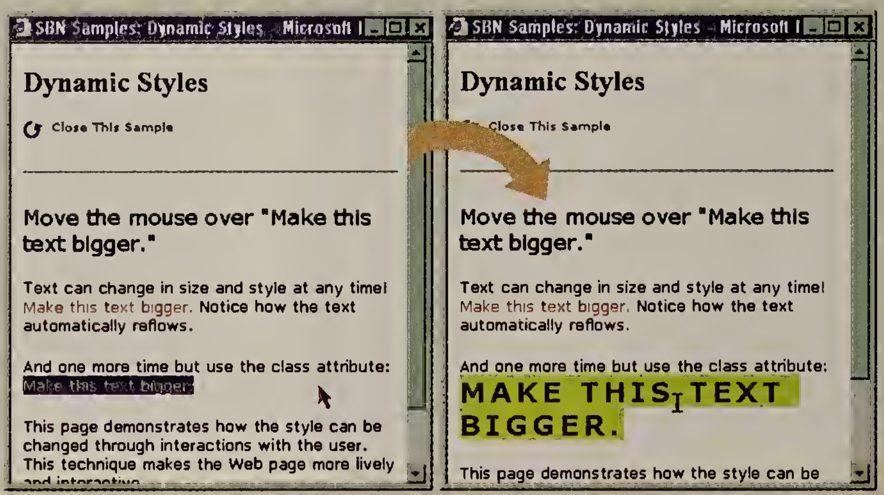
Microsoft Internet Explorer, take five

Upcoming version promises to improve performance, facilitate Web application building.

By Andy Eddy

Redmond, Wash.

Microsoft Corp. recently released a developer preview of Internet Explorer 5.0 (IE5), which gives an early taste of new features and a glimpse of what could be the next generation of Web-based application delivery mechanisms.



MICROSOFT MAKES INTERNET EXPLORER MORE DYNAMIC

Dynamic HTML can cause changes to a page when the user's mouse rolls over a designated element. In this example, simply moving the mouse over the words "Make this text bigger" does just that.

Dynamic Styles

Move the mouse over "Make this text bigger."

Text can change in size and style at any time! Make this text bigger. Notice how the text automatically reflows.

And one more time but use the class attribute: Make this text bigger.

This page demonstrates how the style can be changed through interactions with the user. This technique makes the Web page more lively and interactive.

Dynamic Styles

Move the mouse over "Make this text bigger."

Text can change in size and style at any time! Make this text bigger. Notice how the text automatically reflows.

And one more time but use the class attribute: MAKE THIS TEXT BIGGER.

This page demonstrates how the style can be

The software giant was careful not to tip its hand too much.

Craig Beilinson, a product manager for Windows, said that it is too early to speculate on how long it is going to take to release a commercial version of IE5, but the new features will be welcome.

One improvement in IE5 is data binding. This process involves moving data to the client side, where subsequent requests for it can be processed more quickly without continuously querying a remote server and taking up as much bandwidth.

Additional features

Other benefits will come from such improvements as faster layout of tables; not requiring a check of the server if a cached item hasn't yet "expired," which reduces bandwidth and server loads; improved drag-and-drop capabilities; and support for Extensible Markup Language, cascading style sheets, dynamic HTML and DHTML behaviors.

DHTML behaviors is a proposal recently submitted to the World Wide Web Consortium (W3C) that enables site developers to apply different styles to a Web page.

In an effort to improve the evolution of the browser from being a Web-page viewer to a future as the centerpiece for running Web-based applications, features are being added to IE5 that Beilinson claimed provide "faster coding of applications and faster applications."

One such improvement is in the enabling of "browserless applications" by taking HTML documents and tagging them with a new file extension, HTA. Because some applications don't require browser components such as back and forward buttons, IE5 gives developers the ability to bring up HTML-based pages in their own windows and with the appearance of standard 32-bit applications.

This could facilitate the creation of stand-alone applications, such as for user administration of a 401(k), without unnecessary user-interface elements.

Due to the architecture Microsoft has put in place for its operating systems, IE5 components can be installed on Windows 95 or NT.

They can also be installed on Windows 98, even though that operating system currently has a version of IE4 seamlessly integrated into it.

Response to IE5's feature set by users has been mixed. Many of the initial impressions were that IE5 isn't much different in appearance from IE4.

Penelope Baker, a manager of information systems for a Detroit area company, said "I didn't see too much that makes me sit up and go 'Wow!' but I liked some of the new features, such as drag-and-drop in a File Transfer Protocol session and better maintenance of favorite sites, as well as improvements to the Outlook Express mail client.

News from the campus

Daniel Cerman, a college student and Web page designer in Fort Collins, Colo., said that IE5 can use a vast improvement in standards compliance, and that while some of the features in IE5 will be beneficial to page designers, adding them to a current page design is limited because they're not supported widely enough yet.

"New features such as 'behaviors' look nice, but I do not plan to use them because they do not validate as HTML 4," Cerman said.

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Novell touts ManageWise upgrade

By Paul McNamara

San Francisco

The ability to monitor Novell Directory Services (NDS) and new support for Microsoft Corp.'s Windows NT will be key features of ManageWise 2.6, Novell officials told business partners at a conference here last week.

Novell's next version of its network management software is in beta test and is scheduled to ship before the end of the summer.

Featured enhancements in ManageWise 2.6 include:

- The addition of monitoring capabilities over NDS that can generate 130 alarm types to signal problems in an NDS tree. These early warnings will allow administrators to pinpoint an abnormality early enough to keep it from causing more widespread disruption, the company claimed.
- The management console for ManageWise 2.6 will run on Windows NT, which Novell officials said had been on administrator wish lists. The current version runs on Windows 95.
- Out-of-the-box Year-2000 readiness that fixes what the company described as minor cosmetic issues in ManageWise 2.5. A free patch that addresses the problem is available from Novell's Web site.
- Upgraded virus scanning capabilities and patches.
- Integration with the next version of Z.E.N.works, Novell's complementary desktop management tool.

The company said this integration will let administrators manage end-user resources more efficiently.

Z.E.N.works will eventually become the desktop management component of ManageWise, Novell officials said, with both products being based on ConsoleOne, a server-side network management user interface that will be featured in Netware 5.0.

One ManageWise customer said he is anxious to get his hands on the new features.

"I'm extremely excited about the Year 2000 compliance and am looking forward to the new virus-scanning utilities that will be available," said Robert Pembroke, corporate network manager for Cabot Creamery in Cabot, Vt.

Novell officials put heavy emphasis on the NDS-related improvements in ManageWise 2.6.

"With the increasing significance of directories for our customers, they are also increasingly concerned about the health of the directory," said Lubor Ptacek, a Novell product manager.

ManageWise 2.6 beta code is available for free download at www.support.novell.com/beta/public.

Although pricing information was not announced, Novell officials said they do not expect significant changes from the current pricing, which starts at $795 for a five-user license. ■

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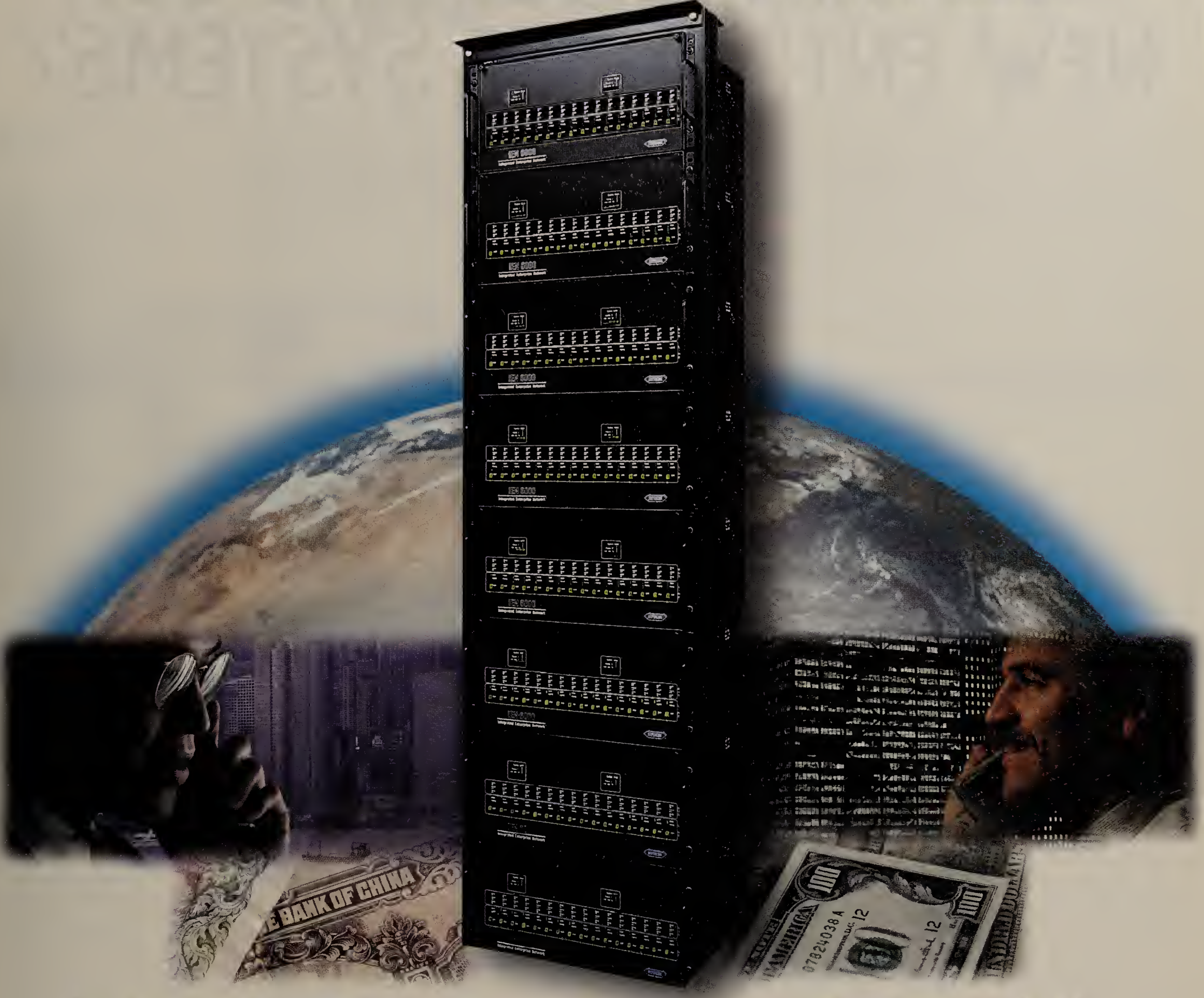

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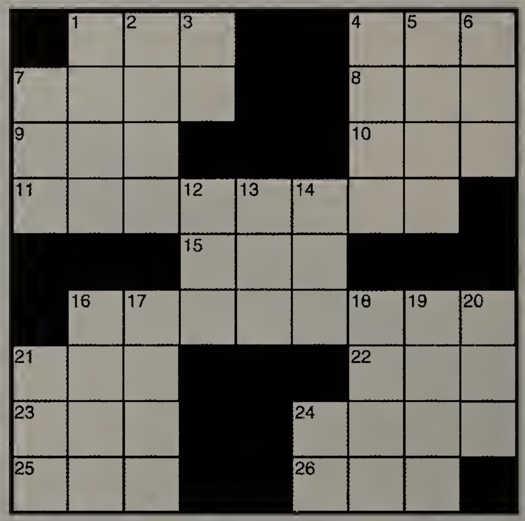
ACROSS

1. See logo
4. Curtsy
7. Piece
8. Honest ____
9. Alias; abbr.
10. Tennis shot
11. Count on
15. Pair
16. NT - not!
21. Mister
22. Server need
23. Little bit
24. Dress edges
25. Stitch
26. Serious software

DOWN

1. For Pete's ____!
2. Eurasian range
3. Not there; abbr.
4. _____ & chain
5. Clarinet's kin
6. Net subset
7. Golfer's goal
12. Give ____ rest!
13. Hole punch
14. Snake that hugs
16. Trig function
17. Mates
18. _____ rabbit
19. Genie's home
20. Double curve
21. Help
24. This guy



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Sun microsystems

LET'S JUST SAY, YOU MAY HAVE SOME EXTRA TIME ON YOUR HANDS.

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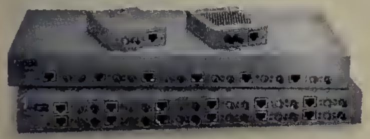
Local Networks

Covering: LAN Hubs and Switches • Management • Operating Systems • Servers • Thin Clients

Briefs

■ **LANart Corp.** *has introduced* **unshielded twisted pair (UTP)-to-fiber converters** *using a new AutoCross technology for connecting legacy equipment with high-speed fiber-optic backbones. The products include a single-mode-to-twisted-pair converter, six- and 12-port single-mode-to-twisted-pair Fast Ethernet microConverters and six- and 12-port multimode-to-twisted-pair Fast Ethernet microConverters. The AutoCross technology automatically matches crossed and uncrossed cables to the proper connection.*



LANart Corp.'s *converter*

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■ **Compaq Computer Corp.** *last week announced software and services for its AllConnect for Unix program, which* **lets Unix and Windows NT computers interoperate** *over a net. Additions include consulting services; Intersolv, Inc.'s DataDirect for Digital Unix software for accessing databases from any Windows client; a feature to let Windows clients share Unix and Network File Systems and directories on remote servers; and the BusinessBus tool suite for letting different types of applications work together on the 'Net. Prices vary based on environment.*

■ **Mission Critical Software, Inc.** *of Houston announced that Microsoft Corp. has selected its* **SeNTry Enterprise Event Manager (EEM)** *software for Microsoft's five Internet and corporate data centers. SeNTry lets managers centrally monitor networked computers and triggers alerts when certain events occur. SeNTry EEM costs $995 per server and $50 per workstation.*

© Mission Critical: (888) 323-6768

In-Site

Schools have high hopes for thin-client service

By John Cox

Lexington, N.C.

Like most organizations, Lexington City Schools in North Carolina has to buy, install and maintain application software on aging computers. That will soon change.

Using a new model, the school system will subscribe to a set of office and education applications running on a remote server cluster. The cluster runs Microsoft Corp. Windows NT Server 4.0 Terminal Server Edition (TSE), plus a companion product called MetaFrame from Microsoft development partner Citrix Systems, Inc. Students, teachers and administrators are connected via a high-speed TCP/IP link over a frame relay network, and the applications appear to be running locally.

The arrangement, which appears to be the first of its kind in the U.S., is intended to let students use the latest software programs, create a more reliable computing system and extend the life of aging PCs.

The software subscription service, created by a start-up called Learningstation.com (LSC), of Charlotte, N.C., may be a forerunner of a new computing model for nonprofit organizations and corporations. LSC plans to introduce a similar concept, with a different set of hosted applications, for manufacturing companies later this month and packages for still other vertical markets in the future.

The school system's 1,800 computers are a blend of Macintoshes and old Intel 386- and 486-based PCs running Windows 3.1.

There are 29 LANs, two WANs and, incredibly, just two support staffers, one of whom is Larry Burwell, the director of computer technology services.

Burwell, like many PC administrators, has been struggling with almost insurmountable problems.

"We wanted something on the desktop that would be low maintenance — no hard drive and no floppy drive," he said. "School kids stick everything they can into a floppy drive."

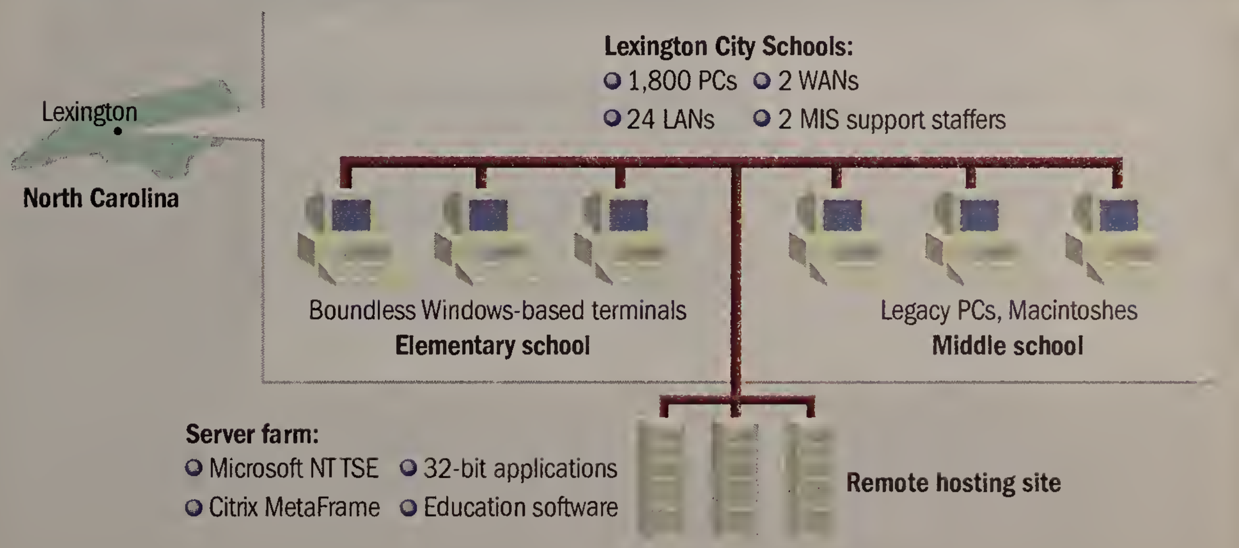
The second problem is students and teachers loading software or making changes to the existing software, creating an endless array of software bugs, glitches, freezes and crashes.

Lastly, with Internet access being offered, Burwell is concerned about access reliability and performance, and about students getting onto inappropriate sites.

He saw a demonstration of LSC's new software leasing service and was impressed by the performance as well as the fact that with relatively little effort, every new or existing client computer, including Windows 3.1 and Macintosh PCs, would be able to access the most up-to-date 32-bit applications. ■

Software leasing via thin clients

Lexington City Schools avoids configuration and management headaches by running applications remotely.



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Sun puts on Redcape

By Marc Songini

Palo Alto, Calif.

Sun Microsystems, Inc. wants to automate storage systems management.

To that end, Sun recently acquired Boulder, Colo.-based Redcape Policy Software Co. for an undisclosed sum. Sun now intends to fold Redcape's Java-written policy-based management products into its own StorEdge storage software and server line.

The result is that users will soon enjoy uniform self-governing and self-healing storage administration, reducing time-consuming manual operations, Sun said.

Sun plans to target users in enterprises that have data warehousing, data mining and online transaction processing applications.

A piece of the Redcape

A key piece of Redcape's technology offering is the Policy Framework tool, written in Java, said Howard Alt, director of architecture and technology for Sun's network storage division.

The Policy Framework comes with preset management components and a took kit for individual development. These components allow users to establish their own preset thresholds in the network that will automatically trigger an alarm in the case of a malfunction.

Once notified of a problem, the system corrects the malfunction and everything reverts back to normal, Sun said.

For instance, the Policy Framework can be used to monitor data distribution levels or to ensure service levels for particular users, Sun said.

The package Sun intends to roll out will give users a bird's eye view of their storage system, Alt said. The Policy Framework lets you step back from the small details of the system and dictate how it is to be administered, weighing things such as price and reliability.

"The software figures out how to deliver the combination," Alt said.

Sun declined to release product availability information.

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WIRED WINDOWS

Just don't call me an analyst!

I am often asked why I bill myself as a "consultant" rather than an "analyst," especially because my writings tend to analyze the market and products in the network field. Although I do know a number of so-called analysts, many of whom are people whose opinion I value, my overall view is that analysts are people with far too much time on their hands, leading to large amounts of fuzzy thinking.

Here's a case in point. Our stepsister organization, International Data Corp. (IDC), is an oft-cited analytical group. Its opinions carry a lot of weight within the industry, and its analysts are frequently quoted within the trade press, corporate marketing pieces and the general press. Yet even this august group can sometimes get caught up in its own rhetoric.

IDC recently published a report about the PC as an "end-user access device" (that is, Web browser platform) called "Death of the PC-Centric Era" (www.idcresearch.com/f/Ei/gens19.htm). In it, the analyst reports that in 1997, PCs accounted for 96% of the devices used to access the Internet, but that by 2002, they will account for little more than 50% — the rest being "... TV set-top boxes, Web-enabled telephones, Web-enabled personal digital assistants and Web-enabled video game consoles." Fine so far. But the report goes on to state, "This shift requires companies that make their living from PC dominance to fundamentally reassess their market strategies."

The fundamental flaw here is the author is equating a shrinking of market share with a shrinking of market size. But nowhere is it stated that there will be fewer PCs accessing the 'Net in 2002, just that there will be alternative means.

Dave Kearns

I could say that in 1956, most travelers — well over 80% — arriving in Dallas got there by automobile. By the year 2000, less than 40% will do so, while over 50% will arrive by air. (Note to editor: I made these numbers up. But then, I'm not an analyst.) I could further say that automobile vendors should start making plans to also handle aircraft (that is, Billy Bob's Chrysler-Plymouth-Dodge-Jeep-Eagle-Beechcraft-Concorde dealership). What this simplistic analysis overlooks, of course, is the massive growth in automobile ownership over that same 40-year span.

So be wary. Look behind the conclusions drawn by analysts. Double-check the logic they're using to prove a point, especially when the analysis provides the basis for a vendor's marketing statements. On the other hand, you should always believe your consultant.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

Visio Pro, from Visio Corp. (www.visio.com), has long been a ubiquitous tool for drawing network maps. Keeping maps up to date, though, is an often tedious manual process. If you're running NetWare 4, however, a new, free add-on to Visio Pro can help. Called Solution Pack for Novell Directory Services, it allows Visio Pro users to automatically import NDS information into the mapping product.

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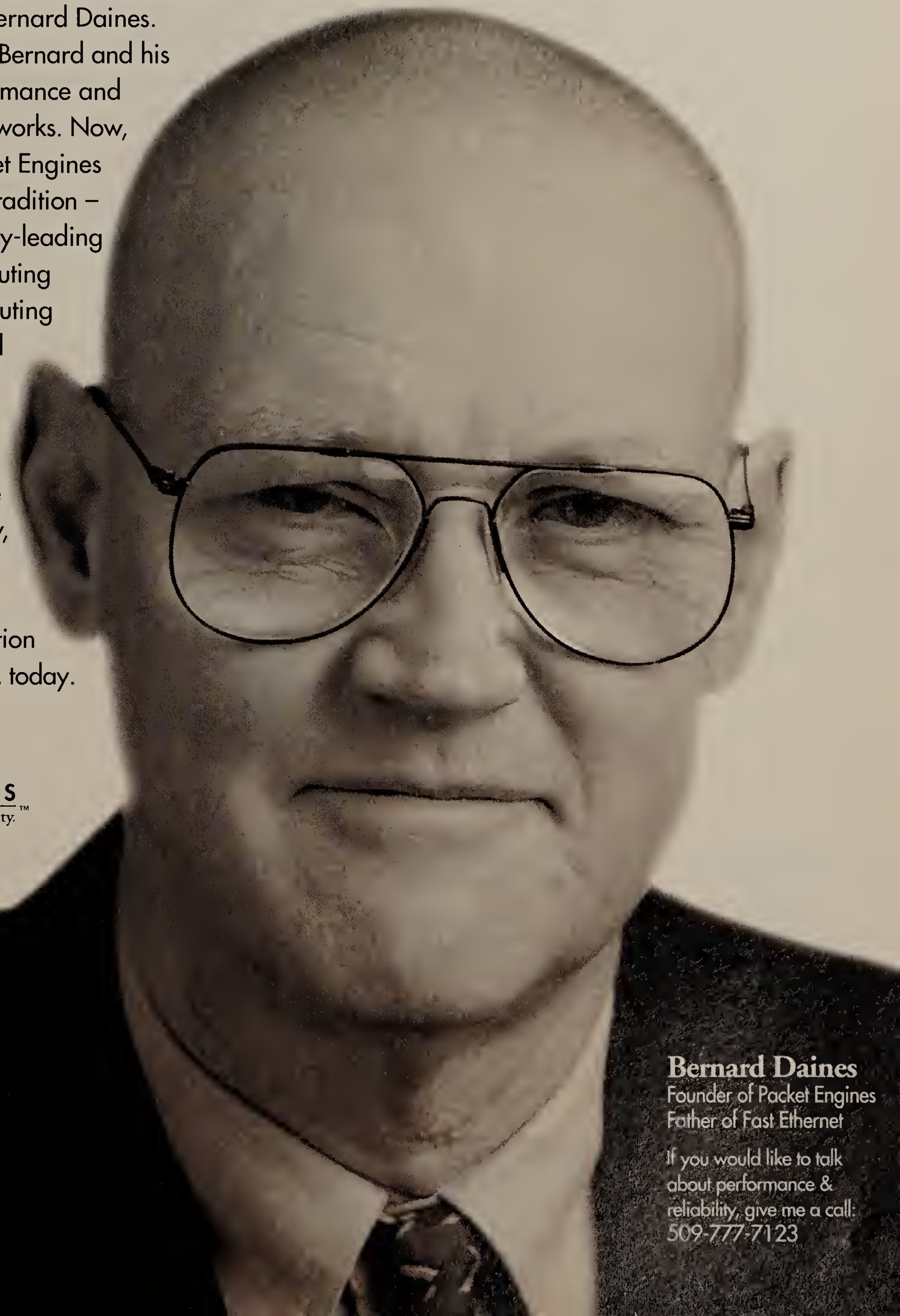

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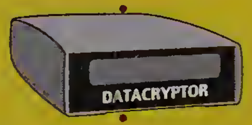

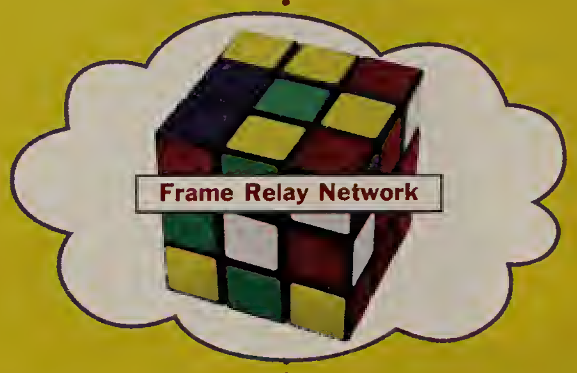

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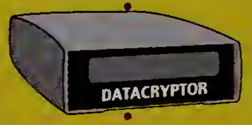

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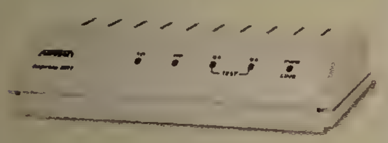
Internetworks

Covering: TCP/IP • SNA • Network Management • Muxes, Routers and WAN switches • Remote Access

Briefs

■ **Adtran, Inc.** *this week will ship* **Express 3000,** *a free-standing Basic Rate Interface ISDN terminal adapter that can also support an analog modem.*

Express 3000 can establish a digital connection over one 64K bit/sec BRI channel while accepting an analog modem call over the second channel. The adapter requires a separate analog modem that is plugged into the back of the Express 3000. Express 3000 costs $369.



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■ **Cisco Systems, Inc.** *last week announced the* **availability of Cisco Network Registrar 2.0,** *IP naming and addressing software. Cisco Network Registrar is licensed from American Internet Corp. of Bedford, Mass. The software provides the user with registration service for Cisco's CiscoAssure Policy Networking initiative. Cisco Network Registrar furnishes dynamic, multithreaded Domain Name System updates and Dynamic Host Configuration Protocol services.*

Cisco Network Registrar costs $7,000 for the first 1,000 nodes.

☎ Cisco: (408) 526-4000

■ *IBM last week announced two new modems —* **the ISDN International PC Card Modem** *and the* **V.90-ready 56K Modem Internet Kit.** *The ISDN modem features high-speed ISDN dial connections as fast as 128K bit/sec and analog connections up to 56K bit/sec. The 56K Modem Internet Kit features Internet access and a suite of Internet software tools. The ISDN International PC Card Modem and the 56K Modem Internet Kit start at $299 and $99, respectively.*

☎ IBM: (800) 426-2255

Fujitsu looks to Layer 3 switches for speed, backup

By Jim Duffy
Richardson, Texas

Expanding operations and a desire to boost network performance and distribute routing functions prompted Fujitsu Network Communications, Inc. to install a switched Layer 3 network.

The maker of telecommunications equipment is adding new buildings to its campus research-and-development network here, and in doing so will have more users and offices to interconnect. So Fujitsu is replacing a Bay Networks, Inc. Backbone Concentrator Node (BCN) router at the center of its network with redundant CoreBuilder 3500 Layer 3 switches from 3Com Corp.

Fujitsu's BCN router is now providing WAN access for the Fujitsu campus.

"We had one router that was the core of our network, and everything went through that core," said Lance Shinall, Fujitsu project manager and senior manager of information technology. "I was looking to disperse that and get something else in the core while we were putting in our new building."

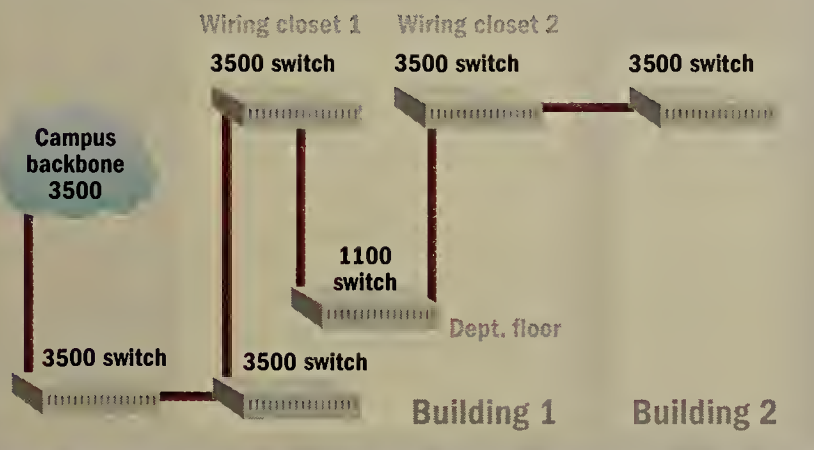
Fujitsu installed a redundant Fast Ethernet network, comprised of 20 CoreBuilder 3500s in the network core, in building equipment rooms and in wiring closets. The company also installed 48 SuperStack II Switch 1100s on building floors.

The network was implemented in two months for less than $500,000, Shinall said. It supports CAD/CAM applications used to develop ATM, Synchronous Optical Network (SONET) and network management products. SAP R/3 and e-mail applications are also running on the network.

Eight hundred Fujitsu staffers currently use the new network, but the company will add 1,000 more over the next few years. Currently the most mission-critical applications on the network are e-mail and SAP R/3, Shinall said.

Department of redundancy

The main focus of Fujitsu's new campus environment is redundancy. Each of the wiring closets in the four buildings in Fujitsu's campus network features dual-homed 3Com CoreBuilder 3500 switches and SuperStack II Switch 1100 workgroup switches for redundancy.



The company chose to go with Layer 3 switching to control traffic flow and avoid latency. Previously, the company connected Bay System 5000 hubs in each building wiring closet to the BCN router in the core. But as more buildings were added to the campus net, Fujitsu decided to experiment with the latest in routing and switching technology rather than buy more BCNs, company officials said.

The BCN slowed transmissions by 1 to 5 msec, Fujitsu officials said. The Layer 3 switches forward packets at wire speed, which they said eliminates latency. Also, Layer 3 forwarding at the edges of the Fujitsu network helps control traffic flow. The switches do this by handling routing locally, which helps contain broadcast traffic. Previously, all traffic had to go through the BCN router in the core of the network.

But the CoreBuilder 3500s in the wiring closets learn the routes from Address Resolution Protocol (ARP) tables instead of performing IP lookups on each packet. ARP "snooping" can also be done at wire speed, which makes it practical to employ Layer 3 routing at the edge, Fujitsu officials said.

Another factor in selecting Layer 3 switches was capacity. Even with up to 5 msec of latency, Fujitsu was satisfied with the BCN's performance; but the company had filled up every BCN port.

"Even with all of our 100M bit/sec links we did not see a performance problem," Shinall said. "However, we were maxed out on slots. We couldn't put anymore in; we used every port." ■

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Concord boosts remote mgmt. software

By Robin Schreier Hohman
Marlboro, Mass.

Concord Communications, Inc. last week introduced network performance reporting software that lets administrators manage the service levels of remote access equipment.

The new software, called Network Health-Remote Access, can track such things as workload distribution among modems, call volume by department or business unit, and the number of failed or successful calls.

IT managers can use Network Health-Remote Access reports for capacity planning and to pinpoint performance problems in any segment of the enterprise.

Network Health-Remote Access extends Concord's Network Health family, which includes performance monitoring and capacity planning packages for ATM and frame relay nets.

Network Health-Remote Access runs on Sun Microsystems, Inc. Solaris, Hewlett-Packard Co. HP-UX and Microsoft Corp. Windows NT servers. It works by automatically discovering the remote devices in the enterprise and polling the SNMP Management Information Bases and Remote Monitoring agents in remote routers, hubs and other network gear.

The application features a graphical user interface that in minutes lets users generate customized reports on network performance and capacity, Concord said. Network Health-Remote Access also ships with an SQL database repository to track historical problems.

Network Health-Remote Access will be available this month starting at $15,000.

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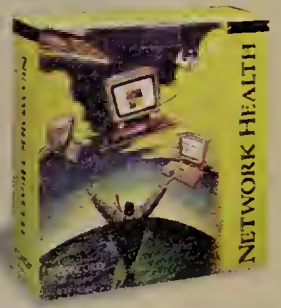

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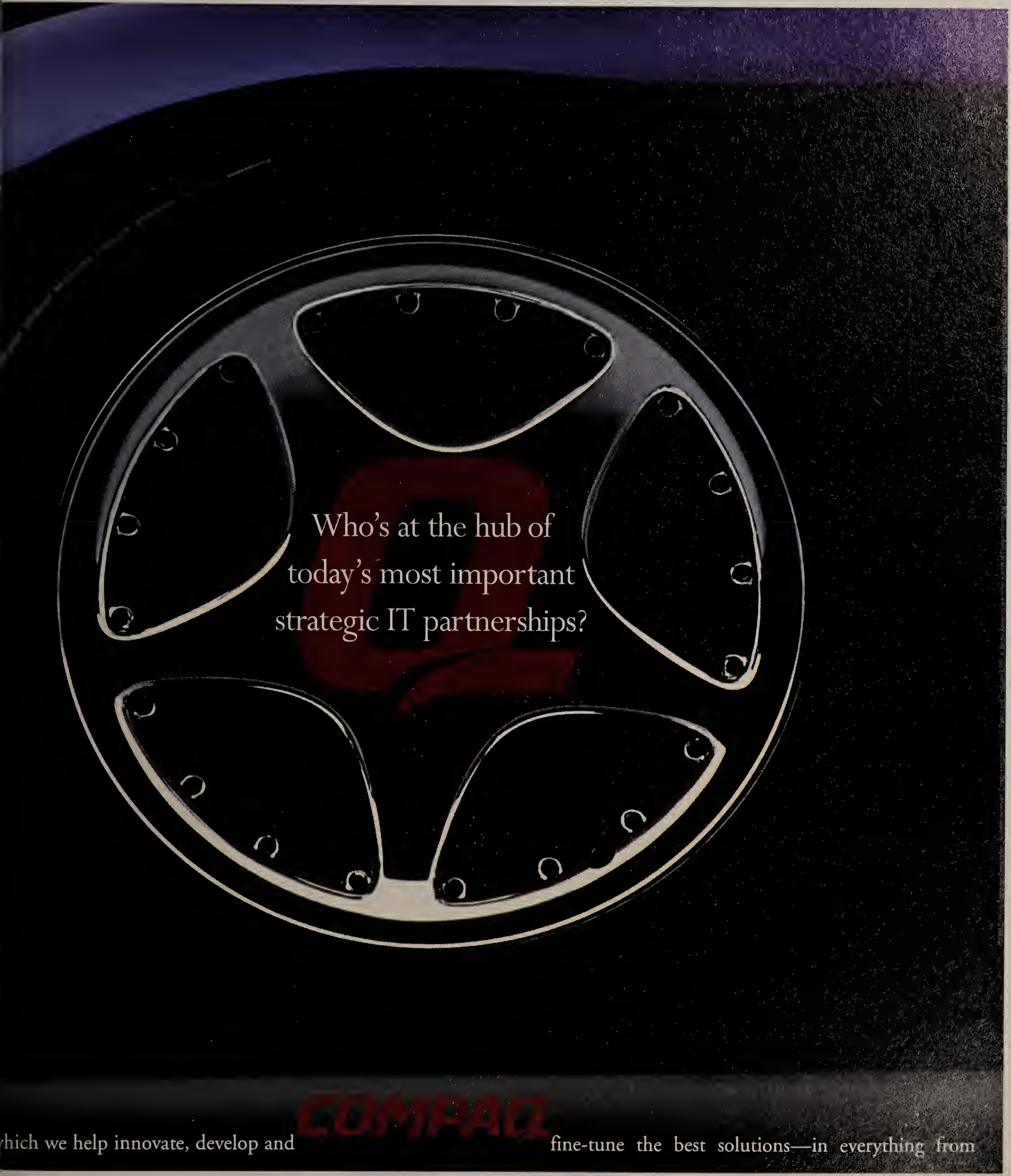
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Big Blue juices up ATM switch

By Marc Songini

Research Triangle Park, N.C.

The IBM 8265 is becoming more than just a pretty ATM box.

Last week IBM announced it would boost the capacity and add new WAN connectivity support to its 8265 Nways ATM backbone switch. The enhancements are aimed at making the 8265 more attractive to users looking to build large, high-speed switched enterprises.

The 8265 is a scalable 48G bit/sec backbone switch that comes in 10- and 17-slot models. IBM said the enhancements to the switch would target large campus users employing high-bandwidth applications such as voice and video.

"Customers are asking to do more functions than just ATM backbone functions," said Lynden Green, director of enterprise marketing for IBM's Networking Hardware Division.

The 8265 will also be attractive to very large enterprise users in need of quality-of-service (QoS) support and LAN access, said Esmeralda Silva, senior analyst with Framingham, Mass.-based International Data Corp. She noted that IBM has done well selling its 82XX family: For example, IBM sold about $24 million worth of 8260 hubs and 8265 and 8274 LAN switches (or some 19,000 ports total). Industrywide ATM product sales and services totaled about $3 billion in 1997.

Among enhancements to the 8265 are the following:

- The addition of Multi-Protocol Over ATM (MPOA) support in the 8265's Multiprotocol Switched Services Server (MSS). MSS controls the routing, bridging, management and congestion control of traffic passing through the 8265. MPOA lets users run multiprotocol traffic such as TCP/IP and IPX over an ATM backbone. Combining the two technologies will let the 8265 anchor and control multiprotocol ATM networks.
- Improved ATM QoS functions in MSS 2.1, including the ability to assign different levels of priority to various data transmissions.
- Increased support for T-1/E-1 links to 192 ports from 32.
- The ability to interwork frame relay and ATM in the same box and enforce QoS across the mix.
- An Enterprise System Connection (ESCON) card from Bus Tech, Inc. that will let users tie the 8265 directly to a mainframe.
- Inverse multiplexing over ATM, which lets users squeeze four (and eventually eight)links supporting ATM transmissions onto one logical T-1 trunk.
- E-3/DS-3 Synchronous Optical Network (SONET) link increases from eight to 28 ports.

The 8265 enhancements will start shipping in September. Pricing for the 8265 depends on configuration.

The MSS Server Version 2.1 software is currently available for $10,000. MSS' MPOA Server support will ship in August as a standard feature of MSS Version 2.1 and will be available to current MSS Version 2 customers as a free upgrade. The MSS Client is currently available at $7,995. The MPOA Client support will be available as a free software upgrade in August.

© IBM: (800) 426-3333

PUMP UP THE SWITCH

IBM's enhancements to the 8265 include:

- Increase of T-1 ports from 32 to 192
- Support for ESCON links
- Support for MPOA server functions
- ATM QoS improvements

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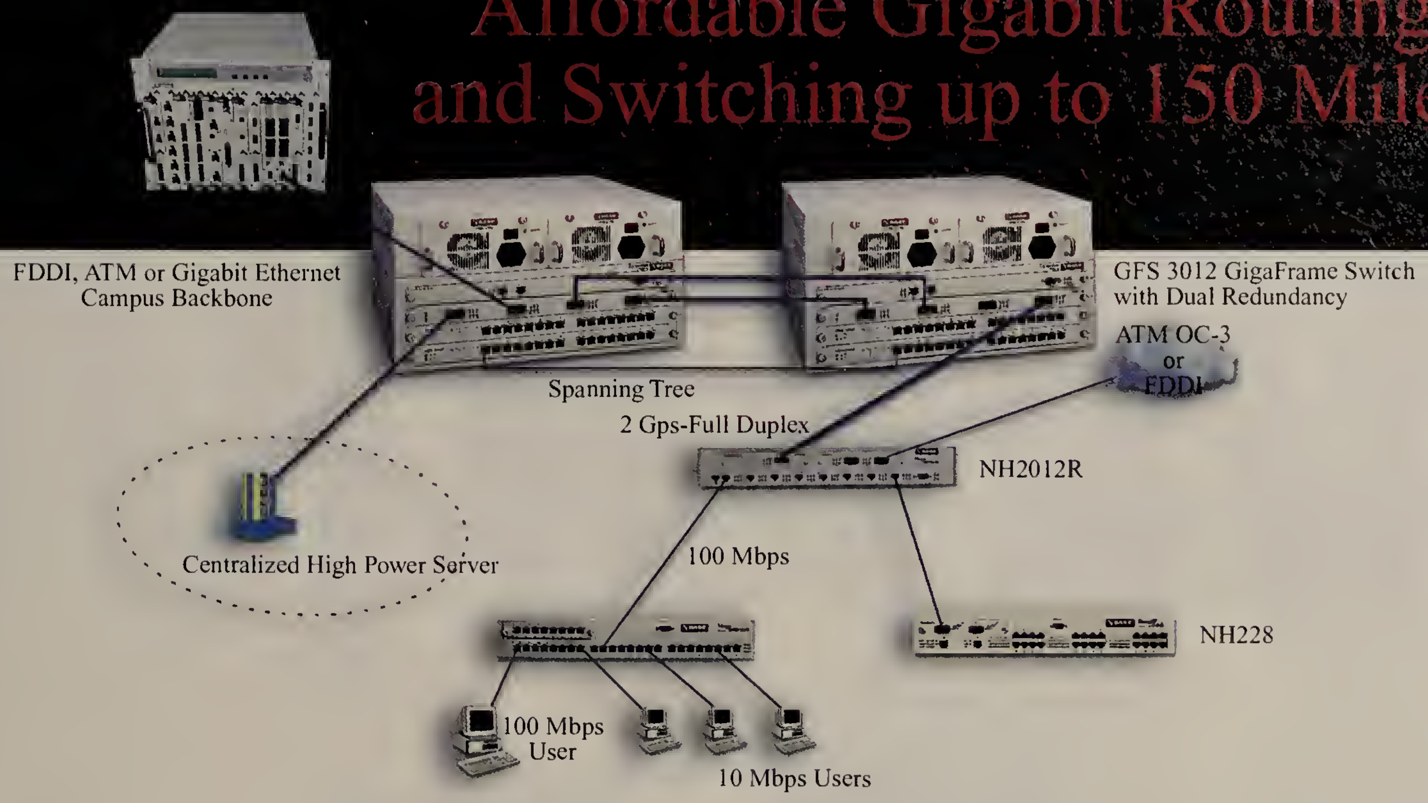

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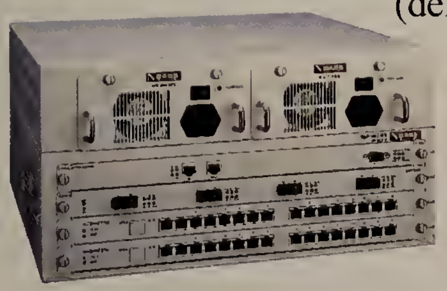

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SPECIAL FOCUS

Mainframe evolution

Mainframe IP mgmt. tools lacking

Users say they are pleased with IP as an access tool, but not much else.

By Marc Songini

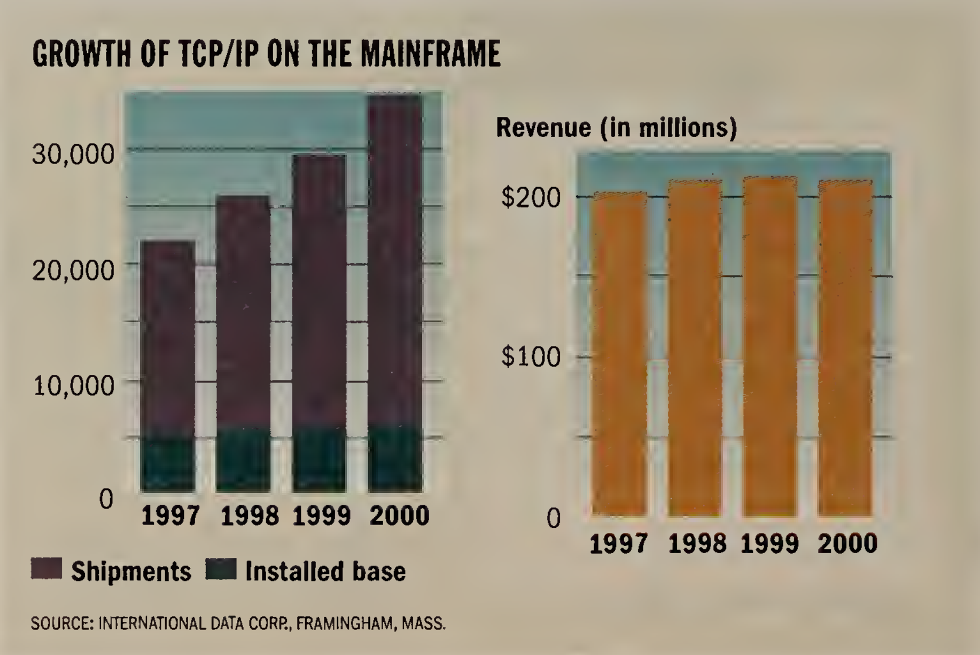
There is little doubt that IP is rapidly becoming a standard part of the mainframe connectivity repertoire, but when it comes to managing that environment, many pieces are still missing.

Specifically, analysts and users say there is a limited variety of tools available for managing and monitoring the performance of IP on mainframes. Speed is another issue. IP processing consumes an inordinate number of CPU cycles on the mainframe, despite the fact that IBM and others have made substantial improvements to its IP stack on OS/390.

For example, IBM typically has promised three- to sixfold improvements with each rewritten stack. And because upwards of 50% of IBM mainframes will be running TCP/IP by year-end, it is imperative that the IP stack performs well.

Running IP on the mainframe often proves to be a clunky affair, says Michael Lowe, vice president of data planning for Citicorp's global technology infrastructure. Getting a mainframe to reduce the CPU cycles it expends on IP "is still a somewhat contentious issue," says Lowe, whose network supports somewhere between 5,000 and 10,000 users.

Ultimately, TCP/IP users aren't used to the features a mainframe has — including high availability, storage facilities and throughput capabilities — but they want them. The strategy for IBM, Cisco Systems, Inc. and other vendors in the IP mainframe connectivity market is to give IP mainframe users the same level of support they were accustomed to in the SNA world.



SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

Performance monitoring tools MIA

For example, one of the biggest missing pieces in the mainframe IP environment is the lack of performance monitoring tools.

Users at MCI Communications Corp. can't view a full session from the mainframe all the way to the end user's IP address, says Laurence Kung, senior manager of networking engineering and design at MCI.

"You can't get a full end-to-end view. You can get one end or the other, but you can't correlate them," he says.

"Clearly, we've got a lot of tn3270 out there," Kung says, referring to the mainframe green screens that are accessing SNA applications over MCI's TCP/IP backbone. Monitoring tn3270 performance is key, he adds.

IBM is trying to answer this problem. Last week, the company announced NPM Version 2 Release 4, which monitors TCP/IP sessions — specifically tn3270 and tn3270E sessions. The focus of the release was to give users the ability to manage net availability and the performance of merged SNA and TCP/IP networks.

And Big Blue isn't alone in its effort to help users measure the performance of IP to the mainframe. Some of the management packages in Cisco's CiscoBlue family also can manage some TCP/IP performance metrics. Sterling Software, Inc.'s Solve:NetMaster software can watch over the performance IP of networks as well. But these packages aren't enough.

There is a need for products "to effectively manage and control the connections over TCP/IP. These tools need to monitor connection by connection and assist in problem determination and resolution when errors in the TCP/IP network [occur]," says Janet Mowat, director of product marketing for Interlink Computer Science, a software vendor. For a decade, Interlink has offered TCPaccess, an IP stack for the mainframe.

"TCP/IP centers need to be able to report on active TCP/IP connections and the applications they are accessing, and be able to look at trend information to help them determine when to upgrade their network capacity," Mowat says.

Interlink was trying to address those needs with its recently announced e-Control, she says. The product lets help desk staff manage and monitor IP on MVS. Cisco and Interlink are also working together to improve the IP stack in the mainframe.

Security concerns

Lax IP security is another issue net managers face. One user says he believes IP offers less protection for sensitive data than MVS. "We had a good MVS security front end," said Ian Blair, systems administrator at the University of Dalhousie in Halifax, Nova Scotia. With IP, "there was some risk involved," and network administrators limited IP access to data queries — those accessing the mainframe weren't allowed to make any changes to applications.

IBM has been trying to address security as well. Recently, the company said it will bundle its firewall, digital certificates and its Cryptographic Coprocessor inside OS/390. In the past, users had to buy the packages separately.

IBM also has enhanced the OS/390 Secure Server with Data Encryption Standard Version 3, a high-end authentication and encryption product. The idea is to integrate the security features on one box so users will not need to attach any special Web servers or other devices to the S/390 mainframe.

New tools needed

And the need for new management tools is growing rapidly. According to Framingham, Mass.-based consultancy International Data Corp. (IDC), last year more than 40% of all IBM mainframe sites with 500 or more end users had IP support. Another IDC report indicates IP will continue to grow in the S/390 market at a rate of 18% annually until it achieves a 97.5% penetration of the installed base by 2001.

However, the perception that IP on the mainframe is catching on like wildfire is not accurate, says Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy. "It's not as common an occurrence as has been suggested," he says. "We've found most of the activity that involves mainframe data is where it's used as a Common Gateway Interface or Java server."

In mainframe shops, most applications are still accessed via CICS or SNA, Nolle says. In such places, according to his surveys, users are seeing an increase in IP applications, but compared with SNA, IP applications on the mainframe are still "in the minority." ■

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L.M. Ericsson Telephone Co. *last week introduced* **a new mobile telephone capable of roaming** *around the world on several kinds of mobile networks. However, the telephone will not be available until the end of 1999. Dubbed World Phone, the handset will be able to operate on GSM 900-MHz and 1,800-MHz networks. World Phone also will work on D-AMPS 800 MHz and 1,900 MHz and traditional analog 800-MHz AMPS systems, the company said. These networks represent more than 175 million subscribers, or 80% of the overall mobile telephone market, Ericsson said.*

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ArelNet, Ltd., *Yavne, Israel, announced a Fax-to-Email (FTEM) software module for its ArelNet i-Tone IP gateway server. The new software module will let users who connect to an ArelNet i-Tone IP gateway, view all of their incoming faxes and e-mail messages. The FTEM interoperates with any standard e-mail application.*

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Dial-up ISDN is a dedicated alternative

Always On/Dynamic ISDN is gearing up for prime time; more products, support coming.

By Tim Greene

It's been a year since vendors announced support for technology promising more efficient use of ISDN capabilities, and products are finally starting to appear.

Always On/Dynamic ISDN (AO/DI) lets users send low-bandwidth packet data over the ISDN signaling band known as the D channel. The D channel can carry up to 16K bit/sec worth of data, and is available to set up and tear down calls, but uses only a fraction of D channel bandwidth when it does. About 9.6K bit/sec of the channel can be used to send packet data.

Because most phone company pricing structures don't include charges for D channel use, the D channel can be a cost-effective way to link remote users.

Ascend Communications, Inc. this fall will add AO/DI support to its MAX line of remote access switches, enabling ISPs to offer AO/DI services. Ascend follows Cisco Systems, Inc., which issued AO/DI software for its ISDN access gear two months ago; Adtran, Inc., which announced AO/DI support last week; and Eicon Technology, Inc., which sells AO/DI adapters.

Ascend and Cisco make the majority of the dial-up access gear used by ISPs. Fifteen vendors have committed to AO/DI support, and an interoperability bake off is scheduled for October, according to Deepak Kamlani, executive director of the Vendors' ISDN Association.

By moving data over an ISDN signaling channel, AO/DI gives corporations a new way to inexpensively set up low-bandwidth, dedicated connections.

Using AO/DI, ISPs could offer customers permanent links to the Internet so e-mail would download directly into a customer's computer.

Some corporate users have devised other applications for the technology. The 288-store eyeglass chain Frame-n-Lens, Inc. is testing an AO/DI network in California that will save the company $1 million per year by improving manufacturing efficiency, reducing the use of 800 numbers for customer service and eliminating jobs.

Frame-n-Lens will use only the D channel of ISDN Basic Rate Interface lines, ignoring the two 64K bit/sec dial-up B channels also available on a BRI, according to Robert Banghart, director of MIS for Frame-n-Lens. The cost is $69 to $80 per month per store, he said, far less than a frame relay or dedicated data service line would cost.

The D channel from each store carries X.25 traffic to a regional node, where it is backhauled to company headquarters in Bakersfield, Calif. There a Cisco router unwraps the X.25 traffic and connects the user to corporate resources.

Orders will be uploaded continuously throughout the day from thin clients in each store rather than once a night over analog dial-up lines, which smoothes out the manufacturing schedule, Banghart said. The link will also give stores access to customer records and insurance information that can streamline customer service and cut the number of voice toll calls to headquarters, he said. ■

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www.nwfusion.com

In-Site

Attorneys use frame relay to build virtual law firm

By Denise Pappalardo
Bechtelsville, Pa.

Who knew you could mix frame relay and a bunch of attorneys and end up with a successful law firm? Well, Warren Prince had some idea.

Prince, president of Prince Law Offices here, wanted to build a unique and successful compensation law firm, but was determined to eliminate the administrative overhead that can come with a large partnership.

Enter Bell Atlantic Corp.'s frame relay service.

Rather than rent office space, Prince's firm built a virtual organization. The firm links its six lawyers — letting them send faxes, make telephone calls and even receive all of their paper mail, which is scanned into the system — over a dedicated 756K bit/sec Bell Atlantic frame connection.

When first setting up the firm's remote sites, the thought of additional administrative salaries and the new equipment needed to support the remote users was overwhelming, Prince said. So he decided that deploying dedicated frame relay connections to each attorney's office would do the trick.

Warren Prince *was determined to keep administration costs down.*

Since the firm began the lawyers in remote offices have used their dedicated frame relay connections for voice, data and fax transmissions. Each site is equipped with a Motorola 6520 MP Router that encapsulates and compresses each user's traffic and sends it over the frame relay backbone.

The virtual network keeps costs down by eliminating traditional public switched telephone network voice and fax traffic charges, and by removing a part- or full-time administrative assistant for remote offices.

In addition to a standard dedicated frame relay connection, the law firm has a permanent virtual circuit from Bell Atlantic's frame relay network near Lebanon, Pa., to the Internet. Prince Law Offices in Reading, Pa., added a dedicated Internet connection.

While the offices connect to local Bell Atlantic frame relay networks, the Lebanon office is ultimately connected to Prince Law Offices' Reading location via the Internet, saving the law firm thousands of dollars in long-distance charges. ■

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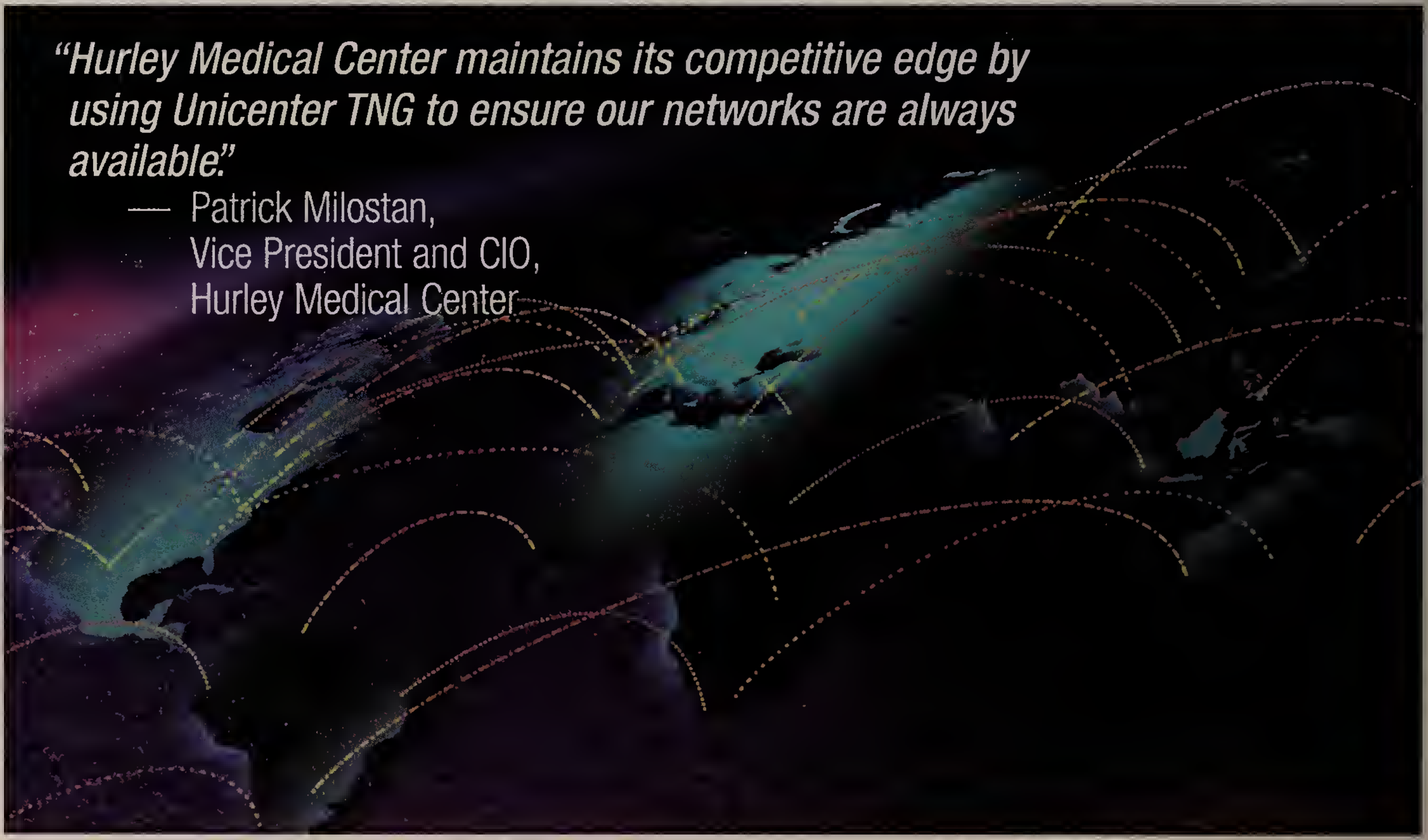

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Digital Island floats new Internet services

Company adds data centers, service-level agreements and online reporting tools to attract customers.

By Denise Pappalardo
Honolulu

Little-known ISP Digital Island, Inc. is hoping to get on the map by boosting its network with more data centers, guaranteeing service and offering an array of network reporting tools.

The company is adding two data centers to its worldwide network. From the data centers, Digital Island will maintain its Web hosting servers and its colocation customers' servers.

The new centers in Santa Clara, Calif., and New York are being added to Digital Island's existing Honolulu- and London-based data centers.

Each data center is equipped with a Cisco Systems, Inc. StrataCom 8400 IGX ATM switch through which all of Digital Island's Unix and Windows NT servers are linked.

All of Digital Island's colocation customers, who deploy their own Web servers at Digital Island's data centers, are linked to the same ATM switch.

Digital Island has also established private peering connections at its two new sites, said CEO Ron Higgins. The private peering connections are providing the bulk of the Internet bandwidth coming into the data centers.

The Santa Clara and New York data centers each have four dedicated T-3, 45M bit/sec peering connections to GTE Internetworking, UUNET Technologies, Inc., Sprint Corp. and MCI Communications Corp.

Customer reaction

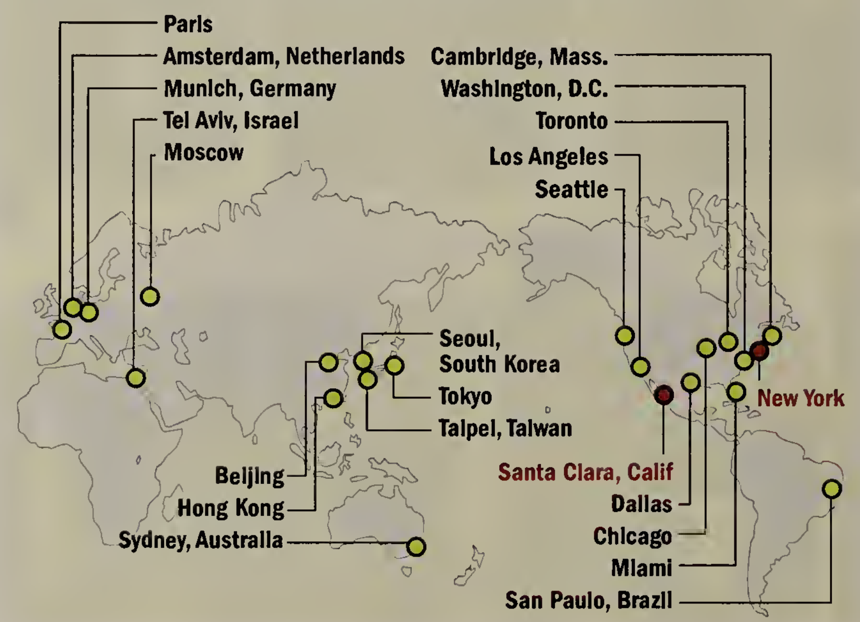
Autodesk, Inc. has been using Digital Island's colocation service since last year and plans to move some of its servers to the Santa Clara site as soon as possible, said Steve Litras, manager of Internet architecture at the San Rafael, Calif.-based software company.

Autodesk has 16 different Web sites that are all maintained on servers in the Honolulu data center, he said. Autodesk's plan is to move its U.S.-centric Web sites to Santa Clara for faster access while leaving its international sites in Honolulu, Litras said.

Digital Island has also made standard service-level agreements (SLA) available to all of its customers.

IT'S A DIGITAL WORLD

With its two new ATM-based data centers in Santa Clara, Calif., and New York, Digital Island is expanding its existing worldwide reach.



The service provider is guaranteeing 99.8% server uptime and 99.6% network uptime at no extra cost.

SLAs are becoming a checklist item for business users. Digital Island's network is designed to avoid the public Internet by moving domestic data traffic only through private peering connections, which keep the service providers' performance up to par, said Chris Roeckl, research director at The Robert Frances Group, a San Jose, Calif.-based consulting firm.

Autodesk has not had any problems with Digital Island's network performance and already has guarantees built into its contract, Litras said.

More for customers

In addition to data centers and SLAs, Digital Island is also making online reporting tools available to all of its customers.

By going to a specific Digital Island Web site and entering a user ID and password, Digital Island customers can run and maintain up to seven different types of reports.

The reports include: customer network utilization; link utilization; overall network utilization; case query tools for trouble ticket follow up; network availability; application logs; and disk space utilization.

✆ Digital Island: (808) 540-4000

WAN MONITOR

Your IT future lies in Nova Scotia

Nova Scotia is a neat place to visit. It's one of those places you can enjoy for a week and during that time do just about everything there is to do.

But soon you might be visiting Nova Scotia for a different reason — to see what it is doing on the IT front.

Maritime Tel & Tel (MT&T) has a grand strategy it is rolling out in Halifax and will soon launch all over Nova Scotia that has many telcos turning their heads.

MT&T has embarked on its so-called Mpowered strategy, which merges telecommunications and computer services into a single outsourced IT plan that could make sense for many businesses.

MT&T has built a Novell server farm for value-added services and is linking it to homes and businesses with high-speed digital subscriber line (DSL) connections running at 3M bit/sec to 7M bit/sec.

The crown jewel of the offering is a very Larry Ellisonesque software-on-demand capability through which customers can rent software on demand.

Daniel Briere
Christine Heckart

The packages cost no more than 70% of the retail price over a two-year period.

MT&T's software list has over 1,000 titles from many vendors, with one gaping hole: Microsoft. While MT&T is negotiating with Microsoft to remedy the situation, packages from Lotus, Corel and other big-name vendors are available.

The high-speed DSL connections enable software to be downloaded in about five seconds, so there is a slight delay in loading the software on a machine.

But to date, users have not seemed to mind. The software is always current; the servers are maintained 24-7. As part of the service, MT&T handles backups, maintenance and other server issues.

Based on its market research, MT&T says it expects to get 50% of the servers in Nova Scotia on the company's system. That will position MT&T to be a major player in all future value-added services, including electronic commerce applications.

With the MT&T service, LANs and WANs can be set up quickly. If everyone has high-speed connections into the same places, virtual private networks, Internet telephony applications and other value-added services can be added fast as well.

The access links are attractively priced — about $30 for residential and $65 or so for business. The prices are low enough that most people do not think twice about installing the DSL access.

What you get for that is the high-speed unlimited always-on Internet access, access to the virtual software library, five private e-mail addresses (additional e-mail addresses are $5 each), 5M bytes of personal Web space and 24-7 customer service. No extra phone line is required. Existing telephone services remain completely uninterrupted.

The installation cost, which is about $150 but more for business installs, includes the Ethernet card for the PC.

MT&T's fees for software-on-demand vary according to the software application and the usage option chosen.

However, users can access software starting at $1.25 per two hours of use. Higher volume users would pay a rate that effectively is a percentage of the retail price.

For example, users pay 70% of retail for a two-year contract plus updates. A two-week contract costs 20% of retail, and a two-hour contract costs 5%. The same is true for almost all applications.

For instance, Lotus Organizer sells for $33 for two years. File storage costs and other services are extra if you want to use MT&T's servers.

Look for MT&T to license the service to competitive local exchange carriers and others.

Briere is president and Heckart is vice president of TeleChoice, Inc., a consultancy in Boston. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.

Briefs

Ipswitch, Inc. *of Lexington, Mass., last week announced* **IMail Server 4.0,** *the company's Windows NT e-mail server targeted at small to mid-size businesses.*

The upgrade includes integrated Web-based messaging and a new e-mail-to-pager capability. A 250-user edition costs $995, and an unlimited-user edition sells for $1,495. A Web messaging option that supports advertising is available for $995.

©Ipswitch: (617) 676-5700

Platinum Technology, Inc. *last week announced* **Platinum Raveler,** *a Web management tool that lets content creators automatically distribute, display, test and share their work with authorized co-workers from their desktop. Starting at $24,000, Raveler is available for Windows NT and supports Web servers from Netscape Communications Corp., Microsoft Corp. and Apache.*

©Platinum Technology: (800) 442-6861

Entegrity Solutions Corp. *later this month will release a beta version of* **AssureMail,** *software that supports e-mail encryption and digital certificates from Entegrity or VeriSign, Inc.*

The price for AssureMail has not been set but is likely to start at about $49 per seat.

©Entegrity Solutions: (408) 487-8600

Commerce One, Inc. *has begun shipping the Commerce One Multi-Supplier Catalog Version 3.1, a* **Web-based catalog** *that is integrated with SAP Corp. R/3 Materials Management Module. Commerce One Multi-Supplier Catalog 3.1 starts at $350,000 for an enterprise licenses, plus a $100 per-user license fee.*

©Commerce One: (800) 308-3838.

Are Java magic bullets on target?

Technologies that solve Java problems work — mostly.

By Chris Nerney

Ever since it was introduced three years ago by Sun Microsystems, Inc., the Java programming language has been burdened with outsized expectations and major questions regarding its ultimate value in the enterprise.

Specifically, Java critics — and even supporters — cite three problems that have to be overcome for the language to enjoy widespread acceptance in large networks: slow performance, lack of consistent portability and inability to scale.

In response, Sun has unveiled a trio of fixes, or "magic bullets," specifically designed to address each of these issues. What follows is a look at how close each of these magic bullets has come to hitting its target.

Whither HotSpot?

In April 1997, Sun announced with great fanfare its recently acquired compiler technology. Company officials boasted that the technology would double the speed of Java applications, which were chugging along well behind applications written in C++.

That technology, HotSpot, is designed to find the parts of an application that can be accelerated and make them run faster. JavaSoft purchased HotSpot technology early last year from start-up LongView Technologies LLC of Palo Alto, Calif.

Today, however, like characters in a Samuel Beckett play, Java programmers are suffering an angst-ridden wait for this performance savior. Originally due out last summer, HotSpot's debut has been repeatedly delayed, and the commercial release is now scheduled for sometime this fall.

The delay has led to speculation that the highly anticipated technology is having problems.

And that could spell trouble for Java. Even though third-party vendors such as Tower Technology Corp. of Austin, Texas, have devised their own speed solutions, some potential customers are waiting for Sun to find a solution for Java's performance woes before embracing the programming language.

"There is nothing more critical for Sun to get out right now than HotSpot," said Scott Dietzen, marketing vice president for WebLogic, Inc., a San Francisco-based Java application server vendor.

A plug for portability

From the start, the great attraction of Java has been its "write once, run anywhere" promise. And the biggest threat to that cross-platform notion has been Microsoft's aggressive bid to split the Java platform, essentially creating a second version of Java for Windows. Then last December, at Internet World in New York, Sun unveiled plans to release a product designed to overcome Java incompatibility woes in any browser.

The product, eventually called Java Plug-in, would check a user's machine to see if the browser had the latest Java Virtual Machine (JVM) needed to run Java applications. If it didn't, Plug-in would let users download the JVM to reside permanently on the client.

Viewed by many as a brilliant countermove to neutralize Microsoft's effort to limit Java, Plug-in also is designed to allow users with older versions of Netscape Communications Corp.'s browsers to run Java applications.

The software has been embraced by a number of vendors as a way for customers to use their Java-based products regardless of the browsers residing on their desktops.

Plug-in has security vulnerabilities that make it impractical for downloading Java-based Internet applications, said a systems integrator working with a large telecommunications com-

See **Bullets,** *page 34*

TAKING AIM

Sun has tried to address key problems facing Java with several "magic bullets."

The bullet	The target	The outcome
HotSpot compiler	Speeding Java applications	Still stuck in the chamber
Java Plug-In	Cross-platform performance on the desktop	Generally on target
Enterprise JavaBeans	Building scalable enterprise apps	May be a bull's-eye

Netscape still leads in browser share

By Andy Eddy

A recently released study by International Data Corp. (IDC) says Netscape Communications Corp. kept its lead in browser share in 1997, but Microsoft Corp. is gaining in all segments of the 'Net community.

Entitled "U.S. World Wide Web Browser Market Review and Forecast, 1997-2001," the report is a result of surveys in five market segments: home, small business, medium and large business, government and education.

While the results indicate that Netscape stayed ahead in all segments, it lost ground in all but the small-business market. The small-business segment saw the most growth in the browser market, according to the study.

The research also determined the browser has become a multipurpose application, being used increasingly to help manage e-mail, calendar and schedule tasks.

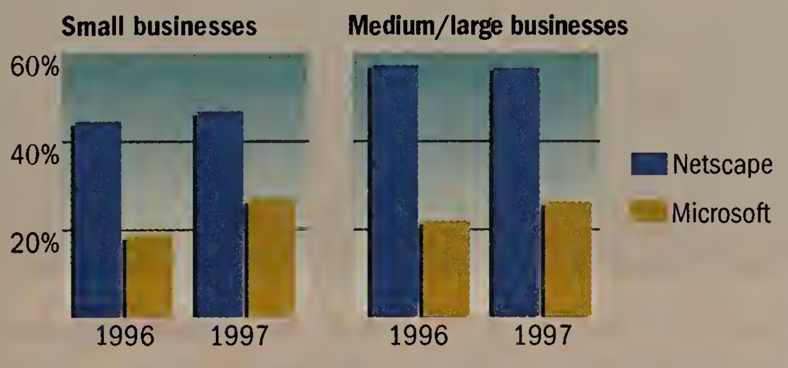
Data for the study comes before Netscape's elimination of pricing on its Navigator browser and Communicator client software suite.

Joan-Carol Brigham, research manager for IDC in Frisco, Colo., predicted that with Netscape's decision to give away its client software, "Microsoft's gains aren't going to be as rapid compared to the time when people had the choice of a free browser and a browser that had to be paid for."

Brigham indicated that Netscape may achieve some future market share momentum from the release of the source code for its client software — a project dubbed "Mozilla." ■

SHARE AND SHARE ALIKE

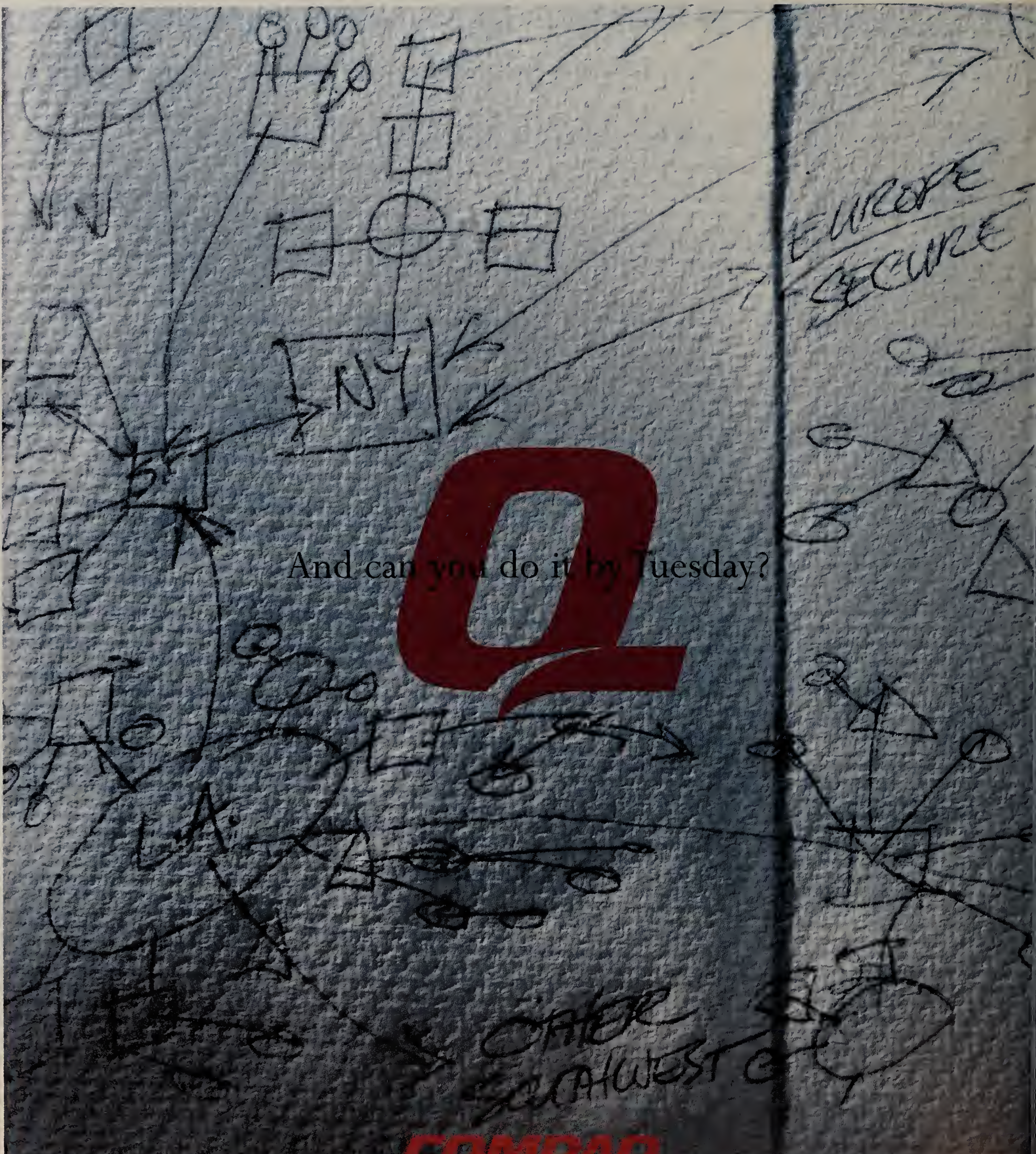
The survey showed that from 1996 to 1997 Microsoft gained ground in all market segments. However, Netscape still holds a lead in business segments with 46.7% of small businesses and 56.3% of medium/large business in 1997.



Get more online:

- Technical overviews of HotSpot, Java Plug-In and Enterprise JavaBeans
- Other Java-related overviews

Find it on Fusion 7844



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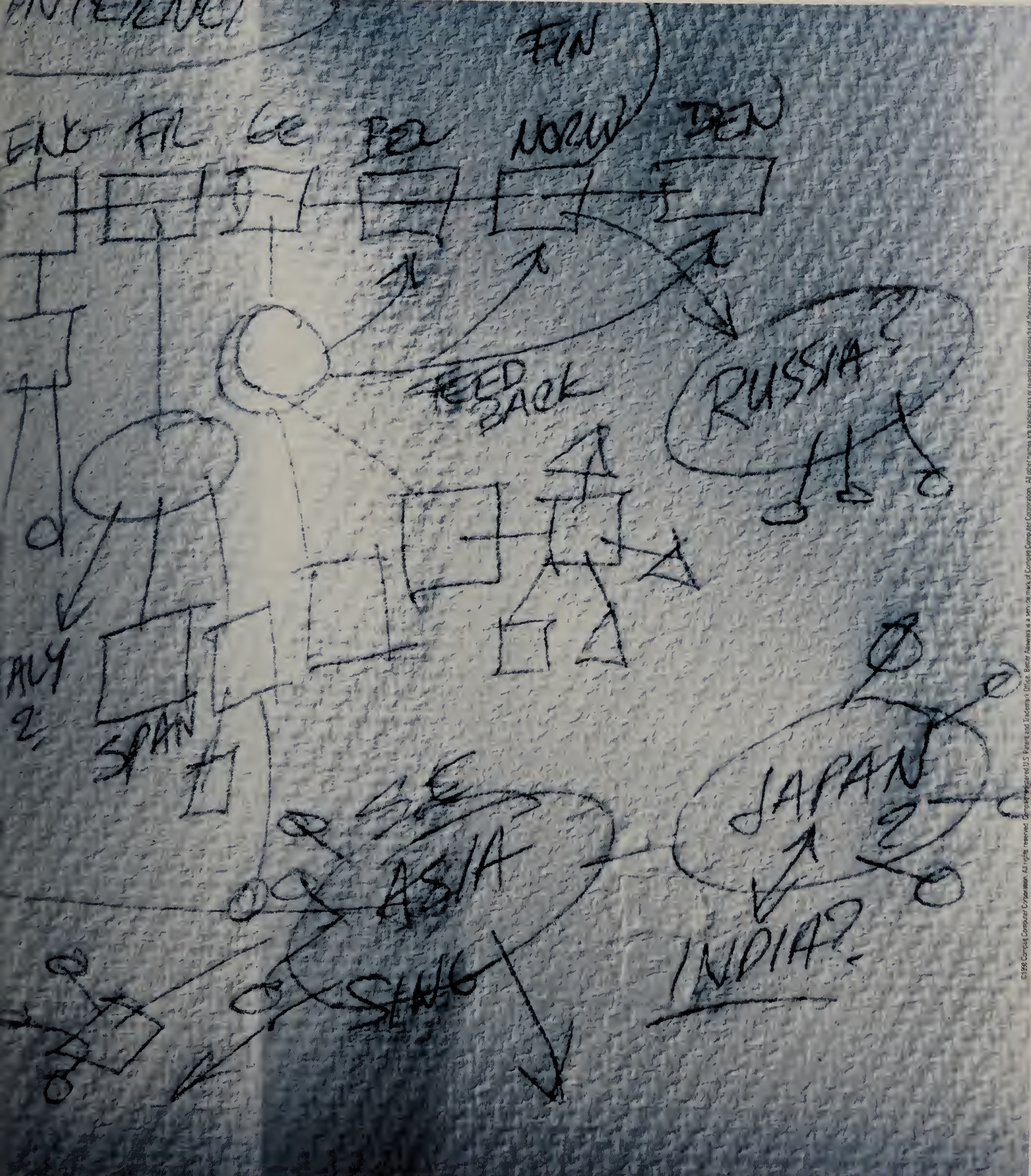

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Despite obstacles, corporations tackle EC

By Ellen Messmer
Boston

Electronic commerce over the World Wide Web can be expensive, and the payoff is not always clear, but that hasn't stopped a legion of companies from trying it out anyway.

In fact, many are jumping into electronic commerce out of fear of being left behind by competitors or just to stake out territory.

Stories and strategies from these electronic commerce pioneers were in abundance at an E-Congress show held here recently.

Online brokerage E*Trade Group, Inc., for example, is expanding its stock brokerage Web activities in the near future to become a "financial destination site" that offers insurance, online financial research and bill payment services.

BankBoston launched a project with the Federal Reserve to let consumers pay for goods on the Internet with an electronic check instead of a credit card.

Manufacturer Fruit of the Loom, Inc., which has begun taking purchase orders from those ordering T-shirts in bulk from its Web site, has gained enough experience in electronic commerce over the past year to be in demand as an advisor to others.

Fruit of the Loom is advising Trane Corp., its Nashville neighbor that wants to try electronic commerce with its distributors for the sale of air-conditioning parts.

And for industrial giant United Technologies Corp. (UTC), electronic commerce is centered on the hope that just by buying office supplies from Web catalogs instead of using paper-based ordering, the company could double its after-tax profits.

"We make $1 billion in profits after tax on $24 billion in revenue," said Dan O'Malley, UTC's manager of purchasing.

Dan O'Malley, *manager of purchasing at United Technologies Corp.*

Paying the 180,000 UTC employees costs about $11 billion, with another $12 billion going to all types of purchases.

"If you could save as much as 10% on what you spend on purchases, you could nearly double the net profit of your corporation," O'Malley said. Nearly all 180,000 employees at UTC are buyers of goods.

Unfortunately, "it's hard to enforce corporate contracts that UTC has in place" that guarantee low prices for volume purchases, O'Malley said. UTC believes the best way to enforce purchasing discipline is going to be through Web-based catalog purchasing, where users are required to place electronic orders by desktop computer.

But unless suppliers and buyers can exchange purchase orders and other information easily and without worrying about interoperability across electronic commerce systems, electronic catalog shopping is not going to work well, O'Malley said.

To that end, UTC has become a key supporter of the Open Buying on the Internet (OBI) specification, which is based on sending electronic data interchange (EDI) purchase orders over the Internet. OBI was finalized just over a year ago, but O'Malley acknowledged the OBI specification has failed to take off so far in product implementations.

The Web auto mall

At General Motors Corp., which operates the GMbuypower.com site to showcase its cars, there's the conviction that when it comes to car shopping, the Web is here to stay.

"We get 500,000 hits per month from just four states," said Robert Gingras, director of electronic commerce at GM. GM is not finding technology to be a barrier to electronic commerce on the Web. The real challenge is figuring out exactly what you want to do from the business point of view because electronic commerce may demand organizational changes internally and with trading partners.

"Web applications could let the buyer sitting on a porch put together their own car with specific wheels or hood, a CD player and the like, and then get the cost for it all," Gingras said.

But is the car industry ready for this type of just-in-time manufacturing? These are just some of the questions the Web raises for the future of electronic commerce, he said. ■

'NET INSIDER

How do you spell VPN?

What do you mean when you talk about virtual private networks (VPN)?

Although it's hardly a new phenomenon in this technical world, VPNs are a case where it seems that for every three people talking about them, there are four or more understandings about what exactly they are talking about.

In speaking to people about VPNs and reading the trade press, I've found the following concepts of what VPNs are:

- A set of frame relay or ATM connections between sites, isolated from other users of the same frame relay or ATM infrastructure by the use of virtual circuits. This type of VPN replaces other types of point-to-point leased lines.
- IP-based tunnels between sites run over a separate IP infrastructure, not part of any general ISP service.
- IP-based tunnels between sites run over the public Internet infrastructure.
- IP-based tunnels from a dial-up ISP's remote access concentrators back to a corporate firewall with the logic and control provided by the ISP.
- IP-based tunnels between a remote user and a corporate firewall with the logic and control split between the user's computer and the firewall.
- IP-based tunnels between a client program running on a user's computer and a server at the same or different sites.
- IP-based tunnels between an Internet-based provider of specific services — a pager company, for example — and a firewall or on-site server.

Scott Bradner

An additional level of confusion is that an IP-based tunnel may or may not be encrypted and may carry protocols other than IP and SNA, for example.

There is a distinct difference between the first of the above definitions and the rest. ATM- or frame relay-based VPN services basically are regular telephony services. They are minor improvements over the long-established private-line services.

In these types of VPNs, the purchaser is responsible for providing all management and other functions above Level 2 connectivity. Buyers can use the connections for anything they want, from PBX interconnections and videoconferences to data networks.

IP specifically is involved in all of the other definitions, but aside from that common feature, they are very different. In some cases, the VPN is a specific service of an ISP. In others, it's merely something that looks like a normal IP connection over a network.

IP-based tunneling also provides an opportunity for additional confusion. IP tunneling is done by encapsulating a data packet within a normal IP packet for forwarding over an IP-based network. The encapsulated packet does not need to be IP, and encapsulation can include encryption for more security.

There has been a lot written about VPNs in this and other technical publications, but with the confusion over the meaning of the term, much of what is written seems guided by vendors' marketing plans rather than by concise reporting. It would be nice if that changed.

Disclaimer: Harvard does not need marketing plans (any new ones, anyway), and the above are my own observations.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

Bullets

Continued from page 31

pany that wants to use Java.

"The infrastructure for trusted applets is not there," said David Boydston, president of Solutions Consulting International, a Santa Barbara, Calif., company that also sells a serial port control software product for Java applications. "You have to distribute security modules, and people have to copy them to their disks."

Enterprise JavaBeans (EJB) was designed with one goal in mind: to allow Java to play with the big boys.

Introduced late last year — and released as a final specification in late March — EJB was touted by Sun as the tool that would drive Java development to the server in 1998 and shatter the myth that Java was a client-side toy.

EJB features chunks of precoded software that can be joined to build a larger application that can run on a JVM. The component software has been eagerly anticipated by programmers who want to build large, server-based applications but lack adequate tools.

"We're looking to move toward an EJB-based component model on the server," said Deva Hazarika, founder of Moai Technologies, Inc., a Web-based business-to-business auction software vendor located in San Francisco.

EJB has attracted support from other major vendors, particularly IBM, which in March announced plans to add EJB functionality to its middleware products. WebLogic this month released a beta version of its Tengah application server that supports EJB.

Still, while the building blocks for creating powerful server-side Java applications are just about here, the first wave of EJB-based applications likely is months away. Until the applications begin hitting enterprise shores, EJB's legacy will remain unclear. ■

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Microsoft Certified Systems Engineer in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 7476, or send your questions to helpdesk @networkref.com.

I'm working on a client site that has 17 Novell Directory Services (NDS) trees, and I need to know if a container login script (NetWare 4.11) can contain a command to connect to a bindery server outside its own tree.

I want a Windows 95 machine using Client32 software to log in to its tree or server. Within the container login script, I also want to connect to an NT 4.0 server with File and Print services for NetWare (FPNW) loaded. FPNW lets NetWare clients view an NT server as a NetWare 2- and 3-compatible file and print server, and I can map to it using the login server/username syntax in a DOS window. However, I can't do this from within the container login script. I have tried calling a batch file from within the container script that then tries to log in to the bindery server, but I haven't been successful.

Via the Internet

You shouldn't have a problem attaching to a bindery from a login script. Assuming the passwords are synchronized, you should be able to map a drive to the desired server to get access. By setting each department to its own context, you can maintain a separate login script for each area. If each group maintains its own server, you also can use a bindery login script for clients unable to run in NDS mode.

Go to support.microsoft.com and search for FPNW with other keyword variations. In doing so, I found several items that pointed toward applying the latest NT Service Pack and one or more potential hot fixes. Other choices are getting the ZENworks client to see if updated Dynamic Link Library files will fix the problem or using the MS Client for NetWare networks to see if the problem is client-related.

Security protocols establish safe VPNs

By Neil Henry

Virtual private networks (VPN), already popular with many network managers, are gathering momentum, thanks to the finalization of some key standards.

One is IP Security (IPSec), the Layer 3 protocol suite that creates a standard platform for implementing security in VPNs. Another key standard is Layer 2 Tunneling Protocol (L2TP). L2TP is a critical component in enabling VPNs because unlike IPSec, it is able to deliver legacy protocols such as IPX and SNA in VPN tunnels.

Together L2TP and IPSec provide solid, secure tunneling. They are complementary and will give users the best of both worlds in their evolving VPN implementations.

Into the tunnel

Tunneling is the ability to create circuit-like connections across a packet-oriented WAN topology. It is the core technical concept behind VPNs.

Unlike a packet-oriented protocol such as IP, which might send packets across a variety of routes before they reach their common destination, a tunnel represents a dedicated virtual circuit between two endpoints. But because it works across a shared-network infrastructure, tunneling gives enterprises a cost-effective middle ground between packet and leased-line communications.

To create the virtual circuit, a special tunneling protocol must encapsulate each source network packet into a new packet that contains the connection management intelligence necessary to set up, tear down and manage the tunnel.

That's how the prestandard protocols — Point-to-Point Tunneling Protocol (PPTP) and Layer 2 Forwarding (L2F) work. It's also how L2TP, which was derived from these earlier protocols, works.

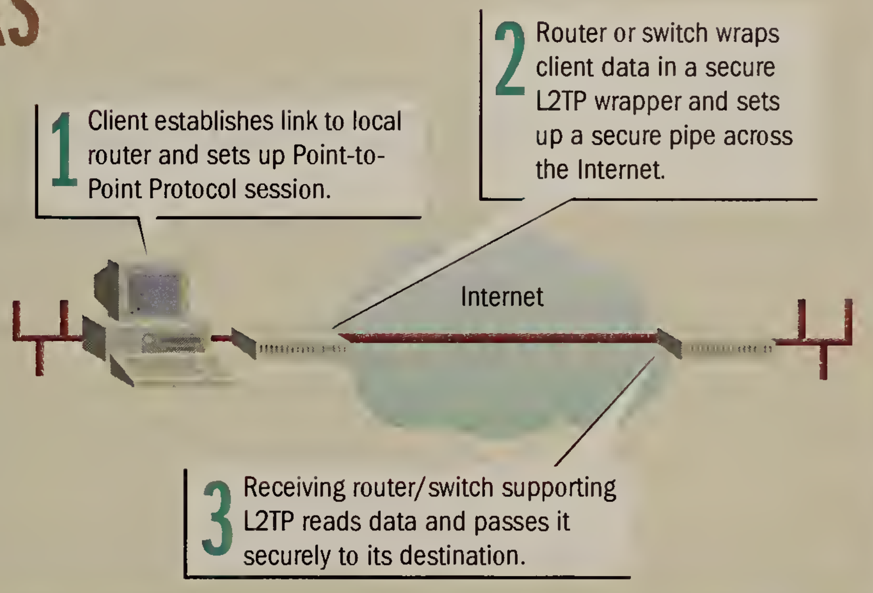
L2TP encapsulates application data, LAN protocol datagram and point-to-point framing information inside a packet that also contains a delivery header, an IP header and a Generic Routing Encapsulation (GRE) header.

The delivery header holds framing information for the medium across which the tunnel will be established, say an IP or frame relay network. The IP header contains IP source and destination addresses and other important data. The GRE holds extensions, such as call signaling, which add connection intelligence.

HOW IT WORKS

Layer 2 Tunneling Protocol

The tunneling process involves multiple steps in which higher level data is encapsulated — or wrapped — in a lower level envelope. L2TP is a critical component in enabling privacy in multivendor virtual private networks because unlike other security protocols such as IPSec, L2TP can deliver legacy protocols such as IPX and SNA in VPN tunnels.



1 Client establishes link to local router and sets up Point-to-Point Protocol session.

2 Router or switch wraps client data in a secure L2TP wrapper and sets up a secure pipe across the Internet.

3 Receiving router/switch supporting L2TP reads data and passes it securely to its destination.

To form a tunnel, L2TP employs two basic functions, a client-like line-server function (called LAC, for L2TP Access Concentrator) and a server-side network server function (LNS).

In a scenario in which L2TP resides in the access concentrator at a carrier's point of presence, the LAC function typically will initiate a tunnel when a remote user activates a PPP connection to an ISP.

After initial authentication takes place, the LAC accepts the call and adds the various headers to the PPP payload. The LAC establishes a tunnel to the LNS termination device at the edge of the corporate network. This device could be a remote access server, a specialized VPN switch or a conventional router.

With the tunnel established, an enterprise-oriented security name service, such as ACE/Server from Security Dynamics, Inc. or the security and naming service built in to Windows NT, authenticates the identities of the user and endpoint

The LNS accepts the tunnel, then establishes a virtual interface for the PPP payload. Incoming frames are stripped of the L2TP header information and processed as if they were normal PPP frames. Typically, a local corporate IP address is then assigned to the session.

Taking control

Vital to optimizing tunnel performance are various L2TP control messages, which run in parallel with the session's payload packets.

During setup, control messages consist largely of exchanges of Start-Control-Connection-Request-and-Reply messages, along with secure call and Caller ID-type values (known as ANI/DNI) to establish user profiles and session destinations. Once the session is under way, the control messages include various problem-detection messages and even a "keep-alive" function to differentiate between tunnel outages and tunnel inactivity.

Control messages may also be used for optional flow/congestion control. This is an important differentiator between L2TP and its earlier incarnations, L2F and PPTP, which did not provide congestion control.

L2TP, now moving toward full adoption by the Internet Engineering Task Force, appears a sure choice for the industry's tunneling protocol standard.

As for security, L2TP defines IPSec as the primary data security and encryption method. IPSec changes the structure of the IP protocol in two important ways: It adds an authentication header and encrypts the payload, which includes the L2TP packet and all other data, such as SNA or IPX, encapsulated within it. But IPSec is designed to handle only IP protocols. Unlike L2TP, it can't encapsulate IPX, SNA or other non-IP protocols (see graphic).

L2TP offers other benefits. Through its ANI/DNI service selection capabilities, L2TP lets ISPs offer differentiated VPN service levels. And unlike PPTP or IPSec, L2TP is capable of running over carrier-trunk protocols such as frame relay and Synchronous Optical Network (SONET). This ability offers carriers and enterprise network managers advantages of network consolidation and cost savings that even go beyond conventional VPN benefits.

Henry is product-line manager of security and VPNs at 3Com Corp. He can be reached at Neil_Henry@3com.com.

EDITORIAL *insights*

Internet leaders need to show some real leadership now

Two weeks ago, Level 3 Communications spearheaded the establishment of a working group aimed at interconnecting IP and telephony nets. That technical initiative is important and will lead to a number of benefits for enterprise customers. But, Level 3 CEO James Crowe says, it's far more important for the Internet industry to get together on the terms of interconnection among ISPs and Internet backbone providers.

To get around capacity problems plaguing overstressed network access points and metropolitan area exchanges, major Internet providers have established one-to-one interconnections — known as peering arrangements — among each other. That's potentially unstable. Peering works when providers are roughly the same size because they're sharing roughly the same amount of traffic. But over time, more powerful network operators wind up with far greater leverage in setting interconnection terms.

Smaller ISPs don't typically have peering arrangements; instead they usually pay for access to the backbone nets. That arrangement also favors the companies that dominate the backbone. Control over the backbone has been a critical issue in the U.S. government and European Union reviews of the WorldCom/MCI merger. Thus, regulators have pressured MCI to sell off some Internet assets.

Crowe, whose company is building a national IP network, says Internet providers must get together to set uniform standards for peering and interconnection. "If we don't, government will step in and that's not good," Crowe says. Those standards will reward backbone providers for investments in infrastructure but won't allow them to hurt rivals or squeeze ISPs.

To see how bad it can be, look no farther than your local telephone network. Regulators and courts continue to scrap with the RBOCS over the terms and conditions of interconnection — a mud-wrestling contest that has delayed competition.

Crowe calls for the establishment of an Internet interconnection council. We applaud that, and we urge the big Internet backbone companies to lead the drive for IP equal access. To really reap the benefits of their intranet and extranet investments, enterprise customers need a vibrant Internet service market. That kind of market can't exist where one or two companies dominate.

So, WorldCom/MCI, Sprint, PSINet, AT&T, GTE and the rest of you Internet market leaders, it's time to show some real leadership. Join forces to work out these interconnection/peering issues.

John Gallant, editor in chief jgallant@nww.com

Merging Technologies • Joseph DeFeo

Mega-deals show the missed opportunity of open systems

Over the past several months, the banking industry has been barraged by a series of staggering mergers, most notably that of Travelers and Citicorp. These mergers are extraordinary in scale and historic in strategy. And although the cross-marketing and cross-sales potential of the deals is enormous, so is the critical task of merging the IT infrastructures of the corporations.

Consider this scenario: You have two large, powerful banks with billions of dollars of transactions per week running on two disparate databases. Each bank has its own IS department, Internet-based services, ATM network and legacy systems. Furthermore, each has its own security policies and implementations.

It's a chief information officer's nightmare. Colin Crook, Citicorp's former chief technology officer, called it "the mother of all high-wire acts." Whatever happened to the open systems that would have made this technological merger a breeze?

Any CIO knows that altering massive, existing IT systems is a major risk. Millions of dollars have been invested in the technology, and billions of dollars' worth of valuable data reside on it. Changing these systems can damage corporate brand identity, image and market credibility — risks no enterprise takes lightly. In fact, a September 1997 IDC report on technology obstacles in Fortune 500 corporations reveals that "the leading technical concerns were transactions, including legacy integration and security."

Meanwhile, the customers of these mega-banks have been cajoled into believing that mergers are a good thing, providing broader services with lower operational costs.

In addition, many end users and business managers believe the Internet will solve whatever technology integration issues arise. That is not so, at least not yet. In fact, it appears that things might get worse before they get better. One recent financial services survey, conducted earlier this year, concludes that 68% of consumers want online information but only 23% of financial institutions plan to provide it. Why? Because doing so is simply not that simple.

For example, real commercial transactions over the public network require security products. Today's products are proprietary, and standards to make them interoperable are few. As a result of such issues — ones that Citicorp and Travelers are currently addressing — it seems bringing the power of the Internet to legacy systems is a thorny issue.

At one time in the industry's development, the opportunity to build, implement and standardize on open systems may have solved today's problems. But technology vendors were eager to bring proprietary solutions to market, and corporations were eager to install them — regardless of the long-term impact.

In hindsight, it is all too clear that if open systems had made their mark, these mega-banks could be reaping the benefits of cross-marketing and cross-selling instead of grappling with the issues of integrating two disparate legacy environments — and then with the Internet.

As the CIO of Barclays Bank during that technology era, I understand open systems were a missed opportunity. But I believe we may be on the brink of another opportunity. The boards of directors, shareholders and customers of large institutions must demand that as these integration issues come up, technology vendors begin to establish long-term strategies that include a view of the global infrastructure and how all technologies can play a role in that infrastructure.

The Internet's explosive growth offers us that opportunity. It is the world's largest open system. It was built by users, not vendors. It provides the beginnings of a global infrastructure — that is, if we ensure that this infrastructure is one for which true integration and interoperability will be cornerstones.

DeFeo is president of The Open Group, a vendor-neutral, international consortium of more than 200 members. He can be reached at j.defeo@opengroup.org.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification

Include freeware

Overall, Joel Snyder's firewalls Buyer's Guide (June 1, page 53) was informative, but he reviewed only commercial software. What about firewall software for Linux/FreeBSD? With so many people using these Unix variants, it would have been appropriate to include some popular freeware. If I am to make an informed choice, I would like to know how these noncommercial products compare.

Edward Rouse
Systems analyst/Webmaster
AGL Resources, Inc.
Atlanta

On Security • Winn Schwartau

It's getting easier to dig up DIRT on criminals

Imagine being able to monitor and intercept data from any PC in the world, anytime you want. If you find such a notion appealing, then DIRT's for you.

DIRT stands for Data Interception by Remote Transmission. Frank Jones, DIRT's inventor and president of Codex Data Systems, is hoping that DIRT will become a major law enforcement tool for stopping the bad guys.

Cops are having a terribly hard time dealing with cybercrime, and they all put online child pornographers at the top of the most wanted list. Suspected terrorists, drug traffickers and money launderers are also potential DIRT targets, as are various criminal organizations that use anonymity, remote control and encryption to hide themselves.

DIRT operates as surreptitiously as a Trojan horse. It is transmitted secretly to a target via e-mail in several ways, including as a proprietary protocol, self-extracting executable, dummy segment fault, hidden zip file or macro.

Once the DIRT-Bug is successfully embedded in the target machine, two things occur. First, all keystrokes made at the target's keyboard are captured secretly. When the machine is connected online, it will stealthily transmit captured keystrokes to a remotely located DIRT-Control Central for analysis. This is how encryption keys are discovered and later used to develop evidence in criminal cases.

Second, when the target PC is online, it will invisibly behave like an anonymous File Transfer Protocol (FTP) server, giving the folks at DIRT-Control Center 100% access to all resources on a targeted computer.

Codex Data Systems' Web site notes that the sale of DIRT technology is "restricted to military, government and law enforcement agencies" (www.thecodex.com/dirt.html). Nevertheless, DIRT represents a questionably legal and ethical means of information gathering.

Dave Banisar, staff counsel at the Electronic Privacy Information Center in Washington, D.C., notes that DIRT raises disturbing questions about enforcement and abuse: "The only way to control this technology is after the fact, during the trial when the police have to show how they obtained evidence."

When I saw DIRT demonstrated last month, I thought, "What if this gets out to the entire Internet community . . . what will happen if we no longer trust our e-mail?"

All that someone with DIRT needs to know is your e-mail address, period. All he has to do is send you an e-mail with the embedded DIRT Trojan horse, and he's home free while you are a clueless victim.

Large organizations usually worry about hackers breaking into and entering their networks. Now they have reason to worry that DIRT-Bugs could invade their networks as well, whether launched by an investigating law enforcement authority, international competitors, spies or just hackers.

There are a few steps you can take to increase your systems' resistance to DIRT:

- At your Internet nexus, institute a policy that no executables are to enter your organization without examination.
- Disable macros at your browser as a matter of policy.
- If possible, do not enable file and printer sharing.
- Do not use NT File System unless absolutely necessary.
- Make remote FTP useless by using your own cryptographic protection for critical files.
- Use cryptographic controls that do not require users to enter encryption keys at their keyboards.
- Replace conventional password access with token-based or one-time passwords.
- Remove all floppy disks from networked environments.

Unfortunately, most firms with which I deal do not enforce even the few minor security policies they have developed. This makes it almost impossible to keep DIRT out. However, organizations that use Network Address Translation and proxies in their firewalls achieve some degree of confidence that DIRT's remote access capability will not function.

According to the folks at Codex Data Systems, if you have a solitary PC sitting on a dial-up or a cable modem, there is nothing you can do — today — except refrain from clicking on your e-mail attachments. Of course, ignoring e-mail from strangers is always a good idea. But if I were a cop or a bad guy using DIRT, I would certainly go after your home PC as well as the one at work. It's a whole lot easier, and I am going to learn just as much.

With the advent of more powerful Trojan horses such as DIRT (which only occupies 20K bytes), the threat to our networked systems gets clearer. As Codex Data Systems' Jones says, "There are no more secrets with DIRT."

Schwartau is chief operating officer of The Security Experts, Inc., an information security consulting firm in Seminole, Fla., and president of infowar.com. He can be reached at winn@securityexperts.com or winn@infowar.com.

Snyder replies: Our experience has been that enterprise network managers stick with commercial software and commercial operating systems for their mission-critical applications. Linux and other freeware may be wrapped up inside, but the product is vendor-supported.

We haven't gotten much feedback like yours before. Are there other readers who want to know more about freeware security products? If so, write me at jms@ opus1.com.

Mastering ATM

Your article "Quip-filled debate pits ATM advocates against detractors" (June 8, page 8) pointed out how detractors assert that ATM cannot serve two masters — LAN and WAN. This viewpoint is limited. Realistically, the true master is the enterprise customer.

By deploying ATM in the local-, metropolitan- and wide-area network — and using Ethernet technology at all speeds at the edge — many mid-size and large enterprises have gained a competitive advantage.

A seamless high-performance switched infrastructure across the core of the entire enterprise, capable of supporting a high-quality convergence of voice, video and data, delivers tremendous value that must not be dismissed so easily, even by ATM's detractors.

Gigabit Ethernet will play a major role in lowering the costs of high-performance, data-centric LAN backbones within buildings and on smaller campuses. However, this will not be to the exclusion of ATM in larger LANs and campuses, where high-quality network convergence, plus increased flexibility and scalability, remains important.

Richard Forberg
ATM LAN/MAN business line manager
3Com Corp.
Boxborough, Mass.

DSL vendors are compatible

I read with strong interest your article "Vendors' DSL tests don't go far enough" (June 15, page 1) and feel compelled to respond with some counterpoints that I believe were overlooked:

While prestandard digital subscriber line products are emerging from a variety of vendors offering customer premises equipment and central office equipment, most vendors make a strong effort to engage in real compatibility testing with one another's equipment. I don't think this trend was reflected in the article.

For example, the table erroneously shows many vendors have only one interoperability partner, when in reality lab testing has proven interoperability among many vendors. To generate any success in the rapidly developing pre-standard market for DSL, equipment vendors must initiate and demonstrate platform interoperability. Based on the growing number of service offerings rolling out, it's clear that widespread interoperability is happening.

Greg Langdon
Vice president of marketing
Efficient Networks, Inc.
Dallas

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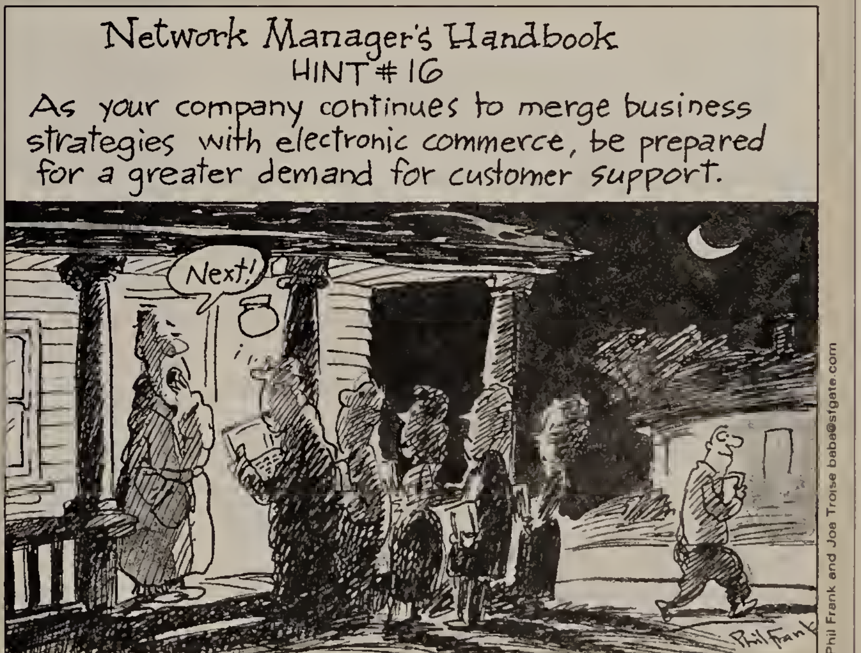

Network Manager's Handbook
HINT #16
As your company continues to merge business strategies with electronic commerce, be prepared for a greater demand for customer support.
Next!
Phil Frank

Phil Frank and Joe Troise baba@sfgate.com

Continued from page 1

With the current pricing plans from most carriers, you pay for a dedicated access line — usually T-1/E-1 or 56K/64K bit/sec — to the carrier's nearest point of presence. You also pay for a port from which all of your traffic feeds into the carrier's network. Then you pay a fixed amount per month for each permanent virtual circuit (PVC), which is basically a nailed-up virtual connection between two sites. The amount you pay per PVC will vary depending on the committed information rate (CIR) you choose in each direction. The CIR is the amount of bandwidth the carrier guarantees will be available to you at any time.

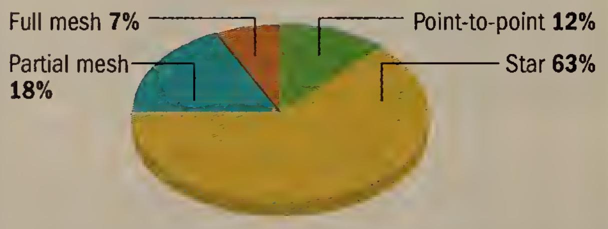
This pricing strategy made perfect sense when frame relay services were first introduced. Users were moving to frame relay from a leased-line environment, and fixed pricing plans made it easy to compare costs for the two services. Perhaps even more important, many of the switches used in early frame relay services couldn't deliver the kind of statistics carriers needed to bill on a usage basis. Times have changed and usage-based pricing is now more feasible, but the PVC/CIR model is entrenched.

Unfortunately, this pricing mechanism discourages users from taking advantage of one of the most important benefits of frame relay and packet networks in general — direct, any-to-any connectivity in a fully meshed environment. Because pricing is heavily dependent on the number of PVCs deployed, users have a strong incentive to use as few PVCs as possible. Consequently, by far the most prevalent topology in which PVCs are deployed is a star, even for organizations that need to share information fairly uniformly among a number of sites (see Figure 1, above).

Figure 1

TOPOLOGY BREAKDOWN

Average results from a survey of 18 carriers show most customers are using a star topology for their frame relay nets.



SOURCE: DISTRIBUTED NETWORKING ASSOCIATES, GREENSBORO, N.C.

The simplicity of the star configuration is offset by the performance loss. A frame traveling from one point to another must be handled by an additional router — the one at the center of the star — and it must cross the frame relay interface at that router twice, once going to the router and again leaving it. The latter point is especially critical because the delay per frame is inversely proportional to frame length (delay = frame length/ link speed). Every time packets leave the carrier's frame relay backbone, they are forced to travel across relatively slow access links — maybe 56K bit/sec or T-1, as opposed to the T-3 links common in carrier backbones (see Figure 2). The slower the access link, the higher the delay. So it's important to traverse as few slow links as possible.

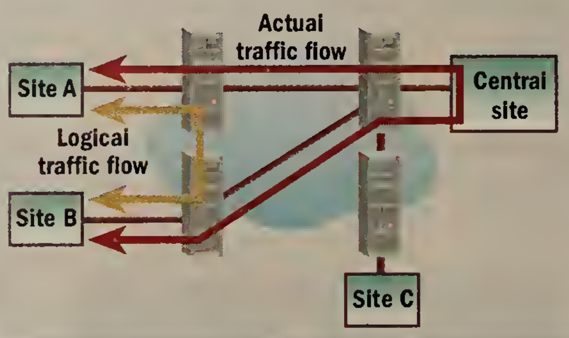
The usage-based alternative

MCI Communications Corp. is the sole carrier offering a usage-based pricing plan that can help you avoid these delays and improve reliability by moving to a full mesh configuration.

Figure 2

THE STAR HAS ITS LIMITS

While the star topology is the most common frame relay net configuration, it isn't always the most efficient. Unless data is destined for the central site, it is forced to travel two extra legs, each of which introduces delay.



Under MCI's plan, the usual charges apply for the access line and the port, but rather than paying a fixed monthly price for the PVC based on the CIR, you pay per megabyte of data received in each direction. The charge is 5.5 cents per megabyte for normal traffic and 4.5 cents per megabyte if the traffic is marked as discard-eligible. Traffic on zero CIR PVCs is also 4.5 cents per megabyte because it is discard-eligible by default. (But because you don't pay for traffic that's not delivered, it's very much in MCI's best interest to deliver all traffic, including that declared discard-eligible.)

The pricing gets particularly interesting when you look at the monthly minimum and maximum charges. The price per PVC is $5 per month for each simplex (one-way) circuit. Because you need to send and receive data at each site, you should really think of the minimum as $10 per full-duplex (two-way) PVC. Still, mid-size networks can easily move to a fully meshed configuration for a minimal price.

The number of PVCs you need to connect a network with "N" nodes in a full mesh is [N x (N-1)]/2. So to create a fully meshed configuration in a network of 20 nodes, you'd need 190 full-duplex PVCs [(20 x 19)/2 = 190]. At $10 per PVC per month, that's a minimum PVC charge of $1,900 — pretty reasonable for what you're getting.

But even $10 per PVC can get pricey if there are enough nodes involved. Fully meshing 100 nodes would cost a minimum of $49,500 per month for the PVCs.

Another important aspect of MCI's usage-based plan is that there's a pricing cap. For each PVC, you declare a CIR, and the price is capped at the rate you would pay if you were under a fixed pricing plan. This gives you some options. On the one hand, you could declare minimal CIRs and, in effect, gamble there will be enough spare bandwidth in MCI's net such that you'll routinely be able to exceed the CIR and still have your traffic delivered. In that case, you'd have each PVC capped at a relatively low cost. At the other extreme, you could opt for relatively high CIRs to cover those times when you need lots of guaranteed throughput, but you'd only pay the requisite $5 per PVC each month. So when you don't need the PVCs, you don't pay for them.

This latter approach could be particularly attractive when planning for disaster recovery and backup situations. Assume in Figure 2 that the central site is the primary processing center. However, a backup data center is available at Site C. In a traditional star arrangement, if a failure occurs at the central site, you'd need high-capacity PVCs from each location to Site C in order to redirect traffic to the backup data center. With MCI's usage-based pricing, the price for having predefined, two-way PVCs from every site of a 20-node network to the backup site would be only $190 per month.

There are other ways to achieve similar results. AT&T, for example, offers a Disaster Recovery Option by which an alternative configuration can be preconfigured, then activated with a phone call. But AT&T charges $16 per month for each alternate PVC (simplex or duplex), as opposed to the $10 you'd pay under MCI's usage-based plan. And if you have to employ the backup PVCs more than twice in a year, you pay an additional activation charge ranging from $1,000 to $3,000, depending on the number of PVCs. Also, with the MCI plan, you can likely configure your routers to look for the backup PVCs should there be a failure at the primary site; no phone call is required.

Breaking even

To find out whether usage-based pricing is a good deal for you, you've got to calculate the likelihood of reaching the pricing cap.

Today, MCI's tariffed price for a one-way PVC with a 64K bit/sec CIR is $47 per month, so that would be the cap on a 64K bit/sec usage-based PVC. At 5.5 cents per megabyte, you can transmit more than 850M bytes of information before you reach the $47 cap. Otherwise, you pay only for what you use.

The next question is, what's the probability of transmitting 850M bytes in a month on a 64K bit/sec PVC? At 64K bit/sec, it takes about 29 full hours of transmitting before you reach the 850M-byte cap (see Figure 3, below).

This doesn't mean the time that somebody's at the office or that the network is available. This means 29 hours of "packet time" — the time a packet is actually being transmitted or received.

This concept of packet time can't be overemphasized. Even a heavily loaded network isn't being used all the time. There are always pauses between packets, and if a location has only a few users, it's very unlikely all will be sending and receiving information simultaneously.

Furthermore, most applications tend to work in a half-duplex mode, so you either send or receive at a given instant — not both.

Figure 3

CAPS TELL THE TALE

At various CIRs, here's how much data you'd have to transmit each month, and how many hours you'd have to be transmitting data, to reach the caps MCI places on its usage-based service. If you come in under these caps, you'll be saving money vs. MCI's fixed prices.

CIR	Price cap	M bytes to reach cap	Hours to reach cap
16K	$16	291	40.4
64K	$47	855	29.7
128K	$105	1,909	33.1
256K	$210	3,818	33.1
512K	$472	8,582	37.3
768K	$735	13,364	38.7

Thus, a location that is actively busy 160 hours per month (eight hours per day, five days per week, four weeks per month) would have to actively transmit data in each direction about 20% of the time the office was open. That's possible, but it's highly unlikely.

Think of it this way: In a typical business, the vast majority of data is transferred during an eight-hour day. That's only one-third of the 24 hours that the network is available each day, so right off the bat, you'll be transmitting less than 33% of the time. Then consider that at any moment, you're very likely only transmitting or receiving; now you're down to about 17%. When you factor in the frequent periods during which no traffic is flowing over the network, you can see that even 10% utilization is probably quite high.

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Another view

Another useful mechanism for calculating whether usage-based pricing is a good deal is to compare it with a price per minute. Let's again assume that we're using 64K bit/sec as a baseline. The price you're paying for a 64K bit/sec usage-based service such as ISDN is probably 5 to 8 cents per minute if you've done a good job negotiating with your carrier. And of course, unlike frame relay services, the dial-up service is full duplex. That is, if you want to, you can transmit and receive simultaneously.

Now let's convert the price per megabyte to a price per minute. Given there are 8 bits in a byte, 64,000 bit/sec equals 8,000 bytes per second, or 480,000 bytes per minute. Because the switched line is full duplex, multiply that figure by 2, giving you 960,000 bytes per minute. That's almost 1 megabyte per minute, assuming you're transmitting full-time in both directions simultaneously. If you can transmit a megabyte in a minute, the price per megabyte and the price per minute at 64K bit/sec is roughly equivalent. Of course, in both cases, you have access fees and other fixed charges, but usually these are likewise roughly equivalent.

So under MCI's usage-based pricing plan, the price per minute for frame relay service is about 5.5 cents at 64K bit/sec, full duplex. But it's important to remember the above discussion of packet times. You're paying about a nickel per minute but only while you're actually transmitting information. By contrast, with the switched service, you pay by the minute whether you're sending information or not. (By the way, it's this analysis that leads to the assertion that because voice over frame relay achieves at least 10-to-1 compression compared with 64K bit/sec PCM, the price for transporting voice is about half a cent per minute.)

You will need to get a handle on your existing traffic load before calculating any savings usage-based pricing might bring. There are tools to help in that effort from vendors such as ADC Kentrox, Hypercom, Inc., Paradyne Corp. and Visual Networks, Inc. You may also be able to cull usage data from your monthly frame relay bill.

But the bottom line is that if you match your projected CIR to a realistic estimation of your needs, you would need to have very heavy traffic to reach the caps.

So if usage-based pricing is such an obvious choice, why aren't all the carriers offering it? It's a combination of a lack of user demand and a lack of competitive pressure.

Tom Noone, director of data services marketing at AT&T, says most of his customers are quite happy with the

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current pricing structure. The customers come from a private-line environment and, because of the nature of their data flows, tend toward frame relay nets that use a star configuration. In that scenario, they are realizing significant savings with AT&T's fixed pricing plan vs. their old private-line nets, Noone says.

But even AT&T isn't ruling out offering a usage-based model within the next couple of years, especially for mesh configurations and for what Noone refers to as "incidental connections."

WorldCom, Inc. is more definitive; a spokeswoman says the company will offer usage-based frame relay pricing in the fourth quarter. A Sprint Corp. spokesman says his company would evaluate the pricing plan if demand develops.

Demand should develop because usage-based pricing has the potential to save nearly any user a lot of money. Under MCI's plan with caps at the fixed-price rate, it's really a no-lose proposition.

Taylor is president of Distributed Networking Associates, a consultancy in Greensboro, N.C., and publisher of Webtorials.Com, a Web site dedicated to market studies and technology tutorials in frame relay, ATM and IP. He is also the co-author of the twice-weekly "Network World Fusion Focus" e-mail newsletter on frame relay. He can be reached at taylor@webtorials.com.

Clarifying relationships

Usage-based pricing is often lumped together with switched virtual circuits (SVC), zero CIR and switched access circuits, but in reality, the pricing issue is separate.

First, switched access is simply an alternative method of reaching the frame relay network through local access facilities. You may or may not pay for the link on a usage basis, depending on your local tariffs.

Zero CIR is a traffic issue — you're essentially declaring all your traffic discard-eligible. There is not a relationship between zero CIR and usage-based pricing, although you do generally get a price break for agreeing to subject your traffic to the lower priority. As noted, under its usage-based pricing plan, MCI offers a discount of 1cent per megabyte for users that choose the zero CIR option. But Sprint offers a zero CIR option that is priced on a fixed-price basis, much like a traditional X.25 service.

SVCs are virtual circuits where the user controls the endpoints, as opposed to PVCs where the endpoints are controlled by the service provider. Because SVCs are often transient in nature, usage-based pricing seems to be a natural fit, but it's not requisite. In the early introduction phases, MCI's SVC offering is based on fixed pricing. You pay a fee for using an SVC-capable port but can support as many SVCs as you want from that port. AT&T also has an SVC offering for its ATM service. This service is based on usage. But rather than being charged by the megabit (or megacell, because it's ATM), it is based on minutes that the service is in use.

— *Steven Taylor*

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FEATURE

Gimme smelter

Old network equipment can fall into all sorts of hands, but most of it eventually suffers the same searing fate.

By Neal Weinberg

Old network gear never dies; it just has a major meltdown. From the most intelligent hub to the dumbest terminal, the vast majority of discarded computer and network equipment eventually lands in the scrap metal heap, where it's disassembled, sorted, shredded, assayed and smelted at temperatures approaching 4,500 degrees Fahrenheit.

Renee St. Denis, *HP's product end of life process manager, helps the company sort through three million pounds of used equipment each month.*

The route to the smelter, however, may be circuitous, given the numerous options companies have for disposing of old equipment. Should you try to reuse the stuff in-house or give it back to the vendor? How about donating it to charity or sending it to a registered recycler?

There are no right or wrong answers, but one common scenario is to have the vendor take back the old stuff. Perry Sheetz, telecommunications manager at Computer Services, Inc., a Valparaiso, Ind.-based company that does data processing for banks, says whenever he upgrades, part of the deal is that the vendor installs the new equipment and takes away the old.

Reuse, redirect or recycle

Donating used equipment directly to a school or charity is an option some companies consider, but they might reject the idea because they don't want problems down the road if the rickety equipment breaks down or can't do what the recipient wants.

For example, when Tufts Health Plan in Waltham, Mass., upgraded to Pentium PCs, it considered selling 1,000 of its old 386 and 486 models to employees or donating them to a charity. But Tufts worried about future support costs, so it nixed both options, says Tricia Hughes, director of informational resources at the HMO.

Tufts donated the boxes to the East-West Educational Development Foundation, a Boston-based organization that refurbishes computers and distributes them to schools and other non-profit organizations.

East-West President Stephen Farrell concedes he's fighting an uphill battle to give a second life to unwanted computers. Farrell says between 15 million and 20 million PCs go offline every year, and about 90% are recycled rather than reused.

Hewlett-Packard Co. has apparently thought about this issue more than most companies; it has an employee, Renee St. Denis, who holds the title "product end of life process manager."

Each month at its Roseville, Calif., facility, HP takes in three million pounds of PCs, printers, monitors and network equipment, St. Denis says. That figure includes outmoded equipment from HP's internal operations in the U.S. and items the company takes back when it installs new equipment at a customer site.

Anything in working condition that can be refurbished becomes available for reuse within HP. If a use can't be found for functioning equipment, it's sold to a broker. Whatever can't be resold is torn apart and sent to a smelter in Quebec.

AT&T follows a similar course. The first option is to upgrade and reuse equipment within the company, says Michele Blazek, manager of technology and environment. For items not claimed within AT&T, the next option is to find a charitable recipient that would make a good match.

Waste not, want not

That which cannot be reused goes the recycling route, and recyclers manage to squeeze some value out of virtually every part of a computer system.

"The only thing we throw in the trash around here is McDonald's wrappers," says Barry Ford, office manager at A&B Recycling, Inc. in Ft. Oglethorpe, Ga. Everything else finds a new life.

Plastic casings are pulverized and ground into pellets, which may end up in anything from children's toys to asphalt highways. Aluminum and metal are melted down and reused. Monitor screens go to a lead smelter. And printed circuit boards, the most valuable items to a computer recycler, go through a smelting process that extracts copper and precious metals such as gold, silver, palladium and platinum.

Other items too labor intensive to be disassembled in the U.S., such as old telephones or certain types of cabling, are typically shipped to China, where labor costs are significantly lower.

In this somewhat murky world, there are no clear guidelines on how much this outdated gear is worth, or even on who should pay whom.

Monmouth Wire & Computer Recycling, Inc. in Tinton Falls, N.J., pays leasing companies and Fortune 500 firms about 3 cents per pound for old PCs. Company spokesman Alan Weintraub says when all is said and done, Monmouth can recoup between 4 and 4.5 cents per pound on desktops.

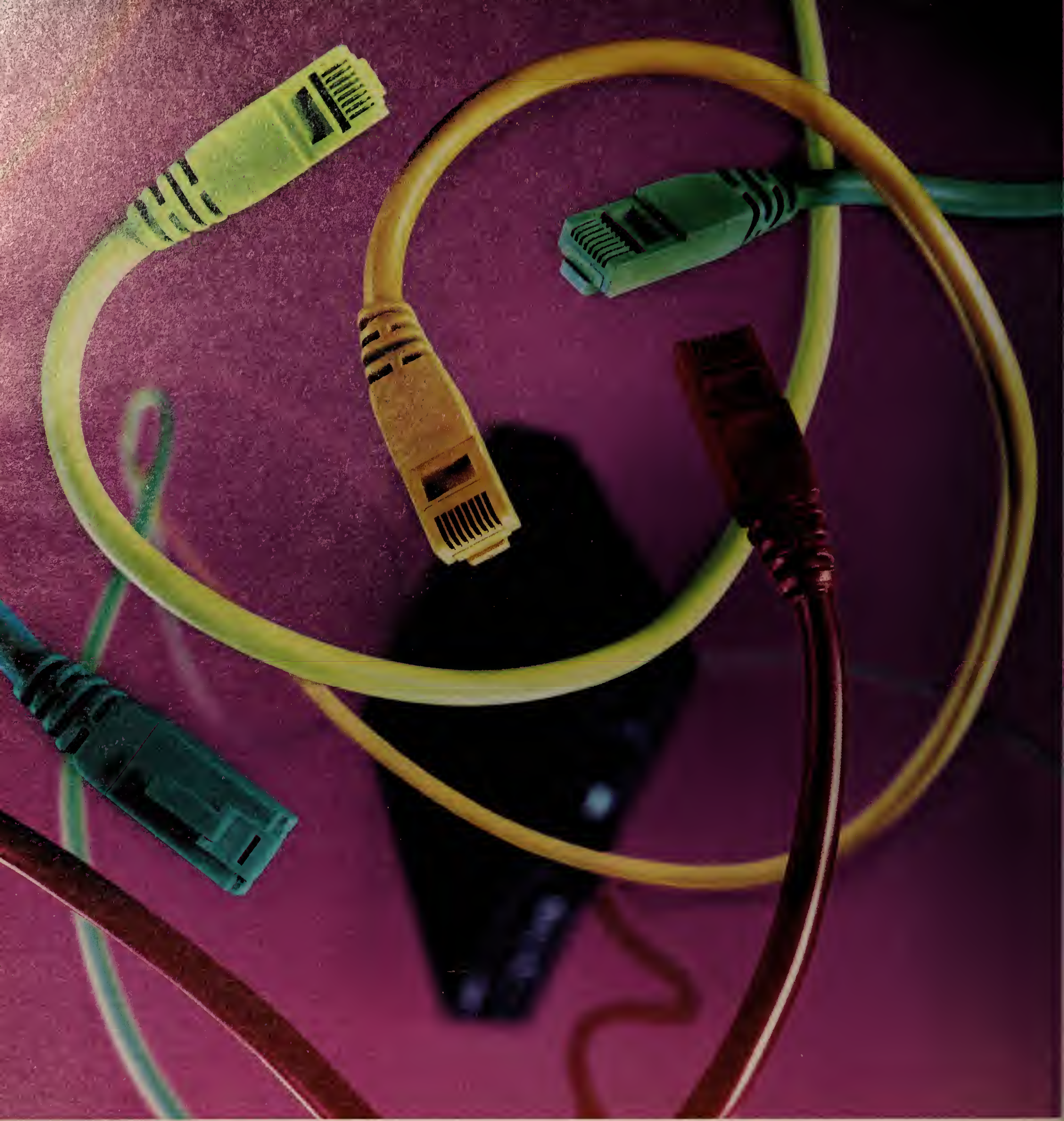
By contrast, East-West's Farrell has to pay a recycler to take donated items he can't whip back into shape. Metech International, Inc. in Mapleville, R.I., gets $1 per keyboard, $6 per PC and $8 each for monitors, which pose the biggest recycling headache because the cathode ray tubes require special handling.

But in the case of routers, which pack more circuitry per pound than a PC, there may be enough precious metals to offset the disposal costs, and the customer might get a check back, says Metech Marketing Manager Jim Gardner.

Typically, Metech opens a box, removes any batteries — which have to be disposed of separately — then takes out and shreds the circuit boards. A 10% sample is assayed to determine the level of precious metals. If recovering the metals makes economic sense, Metech ships the boards to its smelting facility in Sweden.

Gardner points out that the amount of precious metals in these circuit boards is minuscule. A ton, or 2,000 pounds, of circuitry typically yields a mere five ounces of gold.

The recycling businesses operate on low margins. And they are getting hit hard by fluctuations in the market for precious metals and by plummeting prices for PC components such as disk drives. But volume is expected to remain strong from vendors and responsible corporate users who are complying with hazardous waste regulations aimed at keeping LANs out of landfills. ■



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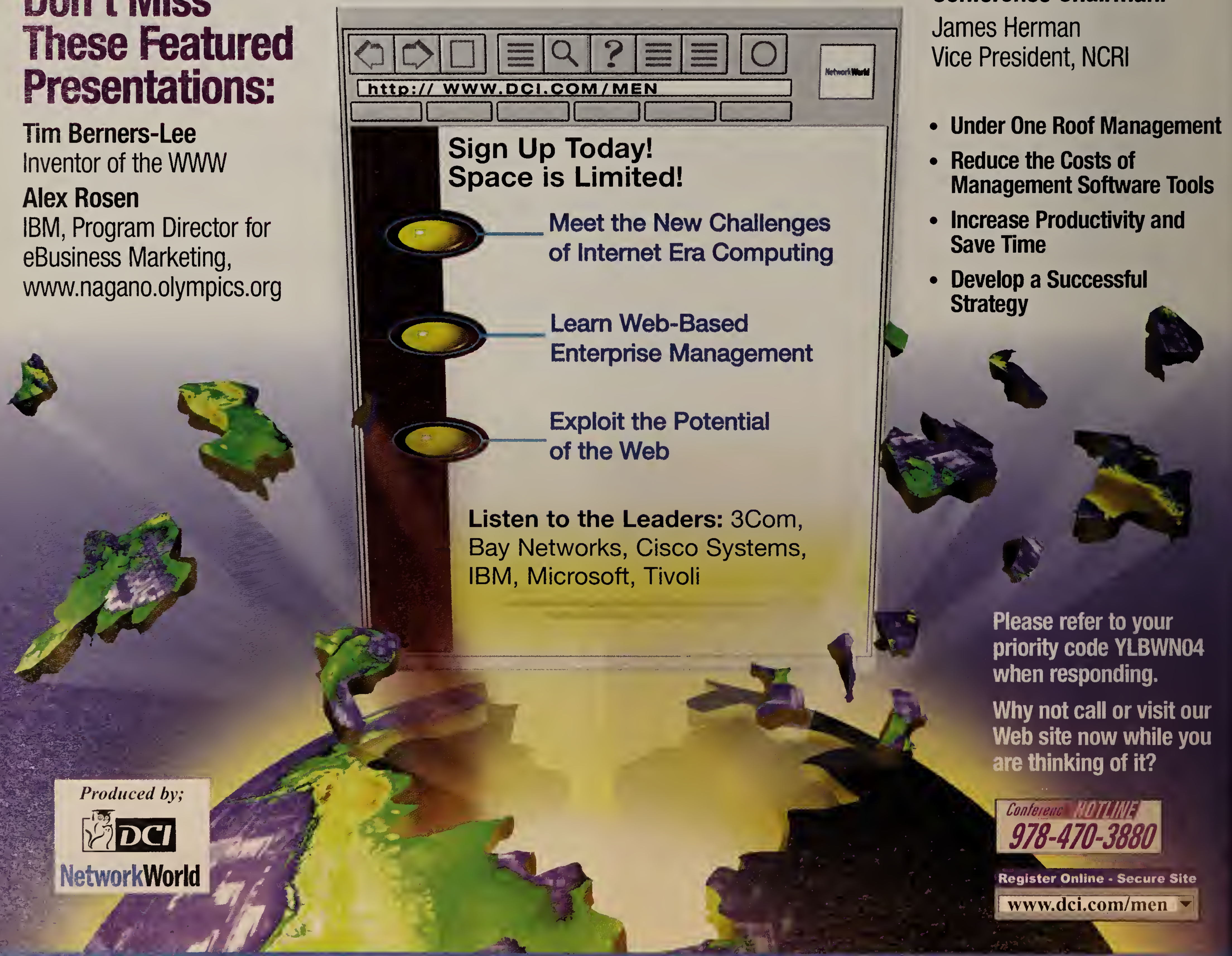

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REVIEW

WITH A LITTLE MORE WORK, BSDI MAILFILTER 1.0 COULD BE A LETHAL WEAPON IN THE WAR AGAINST SPAM.

Can that spam!

By Bob Currier

Make money FAST! Great free PIXXX! Instant credit NOW! How many times per day do messages like these appear in your in-box? Five? Ten? Fifty? Multiply your answer by the number of users at your site, and it's easy to see how spammers can clog the arteries of a high-end e-mail system in an Internet minute.

Spam warriors have traditionally relied upon client-based e-mail filters, databases of known spammers and bogus return address fields (robert.currier@NOSPAM.duke.edu) to fight off the glut of unsolicited e-mail. These techniques all provide some measure of protection but are too cumbersome to maintain and are easily thwarted by dedicated spammers.

We spent a week putting Berkeley Software Design, Inc.'s (BSDI) MailFilter 1.0 — the newest weapon in the war against spam — through its paces. For small to mid-size mail systems, this unobtrusive network appliance has the potential to provide protection against unwanted e-mail. It's easy to install and configure and provides a high level of hands-free spam detection. But the product suffers from poor physical design and a lack of stability.

Score Card

	Effectiveness (35%)	Administration (25%)	Stability (20%)	Installation and configuration (10%)	Documentation (10%)	Total
BSDI MailFilter 1.0	7 x .35 = 2.45	9 x .25 = 2.25	4 x .20 = 0.8	9 x .10 = 0.9	8 x .10 = 0.8	7.2

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

Tag, you're it

BSDI MailFilter provides mail administrators with several methods of detecting and tagging spam. The simplest is a total site ban: All mail from "spam.com" is refused or subject-line tagged as spam. The other options are variants of this method, and all rely on the operator building a table of known spam senders.

That's about all the control you have over the spam detection engine. MailFilter is pretty much a "black box." BSDI provides no details about the detection algorithms. While the company understandably wants to keep its product a jump ahead of the spammers, paying thousands of dollars for a closed system makes us uncomfortable.

Updates to the filtering engine are available at a cost of $1,400 per year or $2,520 for two years through a subscription service that automatically delivers modifications. Operators have the choice of accepting the updates or putting them on hold for manual implementation. Updates from BSDI are merged with your existing tables, preserving your original data. A backup option is available in the event your settings are corrupted.

MailFilter sends reports to the administrator every 24 hours. The reports provide counts of total messages delivered to internal and external sites, and tell you what percentage were spam, tagged, rewritten or rejected messages. A header field is added to tagged messages indicating the level of confidence (low, medium or high) that the message is spam. Rewritten messages have their subject line modified to include a special tag at the beginning of the line.

The reports provide useful information but would be greatly improved by the addition of charts. A Web-based reporting function also would be a nice feature.

Plug and play

While reporting needs improvement, installation is simple. We removed the unit from the packing materials, plugged it into our network, performed some basic configuration via the serial port, and it was ready to go.

We tip our hat to BSDI's technical support staff. We had to call tech support to get past the initial setup menu because our review unit arrived without a license key. The support department was closed when we called but staffers returned our call as soon as the department opened. We wish more vendors were as responsive.

We were somewhat disappointed to find that MailFilter wasn't shipped with a console cable or an Ethernet cable. While most administrators have these cables in-house, you can't manage the box without one, and it would be nice to have everything you need in the box.

Net Results

BSDI MailFilter 1.0
Berkeley Software Design, Inc.
(719) 593-9445
www.bsdi.com/products/BMF
$2,395 (includes four months of filter updates)

PROS
- ▲ Effective spam detection
- ▲ Easy setup and configuration
- ▲ Good Web management interface

CONS
- ▼ Form factor needs work
- ▼ Problems with stability
- ▼ "Black box" design (filters not published)
- ▼ Minimal reporting

The form factor also could stand a bit of work. The power switch is a large, semispherical button located on the right side of the front panel. It looks cool, but it doesn't work well there. We accidentally brushed the switch on several occasions and powered the box down. Until the unit was reset, all incoming mail screeched to a halt. In a busy machine room environment where MailFilter would likely be installed, this is a recipe for disaster. The power switch needs to be recessed and moved to the back.

While we were concerned about the accidental power outages, the tendency of the unit to lock up at random intervals bothered us a lot more. During the week we had MailFilter, we experienced four unexplained system crashes. In three cases, the HTTP Daemon and Simple Mail Transfer Protocol processes appeared to die; the unit responded to pings and had an active console, but wouldn't process mail or respond when we attempted to contact it using the Web console. MailFilter died completely the fourth time.

In all cases, MailFilter came back online after a power cycle. With no user-accessible log files, we were unable to trace events leading to the crashes. None of the other machines on the network segment we were using experienced any problems. We weren't able to correlate the crashes with heavy mail traffic or find any other explanation.

Web console

After you've entered the basic IP address, Domain Name System and gateway pointer settings into MailFilter via the serial port, all further administration and configuration is done using a Web browser. You'll need to make sure your browser supports the Secure HTTP protocol; newer versions of Netscape Navigator and Internet Explorer work fine.

The main administration screen gives you access to all of the controls you need to configure and operate MailFilter. Administration, Status, Filter Updates and Mail Routing settings are all one click away. We were pleased with the simplicity of the Web console but annoyed by the fact that when clicked on, all links bring up another browser window. We found it cumbersome when performing several configuration changes to constantly open and close windows; frames might be a better choice.

How we did it

We installed BSDI's MailFilter 1.0 on our departmental network and configured it to be a proxy server for our e-mail. We used a Dell P2-266 with 64M bytes of memory running Red Hat Linux 5.0 as the mail host. The DNS MX record of the Linux box was modified to point to MailFilter.

We sent MailFilter a variety of e-mail over the course of a week, including legitimate mail with a variety of spam and spam-like messages.

We evaluated the ease of installation and operation, as well as the stability, fault-tolerance, reporting capabilities and automatic filter updating features.

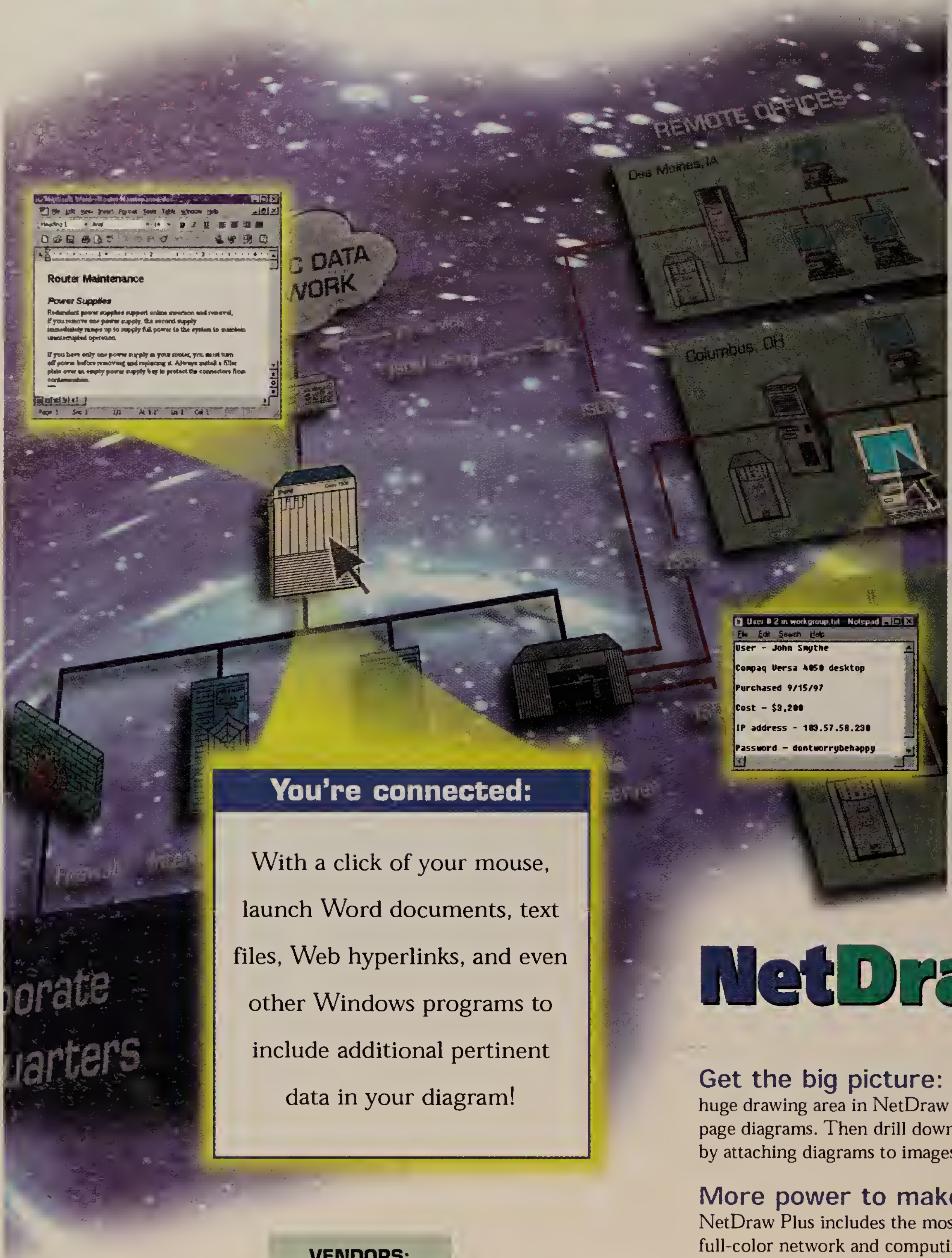
Not ready for prime time

On the plus side, we found MailFilter easy to configure and operate. The spam-filtering engine seemed robust and did a good job of identifying and eliminating the spam we threw at it.

Unfortunately, despite those positive attributes, we can't give an unqualified thumbs-up to the current release. Stability was a problem, the form factor needs work and we would like to see more user-configurable filtering parameters. As much as we liked the concept, we recommend waiting for a revised version of the product.

Currier is director of data communications at Duke University in Durham, N.C. He is the recipient of Network World*'s 1997 User Excellence Award and received an Honorable Mention in the 1997 Excellence in Campus Networking competition sponsored by CAUSE, a users group for computer professionals in higher education. He can be reached at (919) 660-6995 or robert.currier@duke.edu*

Currier is also a member of the Network World Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.



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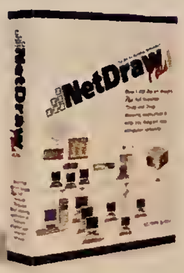

Management Strategies

Employees at play

Computer games can encourage camaraderie among colleagues, but you need to set firm limits.

> *In Doom, you play a Marine who has to escape from a military base on Mars that has been overrun by demons and various other nasties from hell. With an assortment of weapons at your disposal, you must venture into the maze of corridors and rooms, trying to find a way out, whilst all the time fighting the hellspawn that seek to destroy you. . . . Can you do it? Do you have the guts? Grab that shotgun, check your ammo and get to it.*
>
> — *"What is Doom?" from www.gamers.org/dhs/whatisdm/whatisdm.html.*

By Mark Gibbs

Picture this: It's 5:30 p.m. at the office and a 20-something programmer is showing a 40-something account manager and mother of two how to select a chainsaw and slice up the bad guys in a network version of the computer game Doom.

Alternatively, that same account manager might be caught playing a quick game of solitaire while she drinks a cup of coffee at 11 a.m. Are either of these your idea of a good or desirable use of your corporate computers and networks?

Many managers consider all computer game playing to be a trivial and nonproductive use of corporate resources. But not Charlene Vaughn, a partner at venture capital firm Software Investment Corp. in Pasadena, Calif., who has held senior positions at several companies, including Time Warner, Inc. and Interplay Productions, Inc.

Letting employees play networked computer games after hours is a good way to encourage social bonding, Vaughn says. In her experiences, games have fostered cooperation and camaraderie rather than the competitiveness one might expect. And as she points out, "Slicing up your boss with a chainsaw or vaporizing him with a plasma gun can have therapeutic qualities."

But game playing is addictive for many people, so Vaughn says it's crucial to establish corporate guidelines on acceptable usage. Simon Hudson, production manager for Rapid Blue Interactive, an Internet development house in Randburg, South Africa, also finds guidelines necessary.

"We tolerate games being played on the network — within reason. We recently had a blowout between various members of our staff when games were being played at pretty much any time of the day," Hudson says. "Needless to say when some folks are under the stress of a tight deadline and others aren't, this can cause a problem."

Hudson had to introduce some rules, such as "no network games during designated working hours, respect and consideration is king at all times and keep the volume down," he says. The guidelines appear to be working.

However, gaming can have some productivity consequences that you probably didn't consider.

"In the high-tech community, you have literally legions of network gamers after hours. The LANs get saturated from huge multiplayer games of Quake or Doom," says David Knight, co-founder of multimedia software developer RedBox Technologies, Inc. in Los Altos, Calif., and one of the first to develop multiplayer games.

Charlene Vaughn *of Software Investment says there's nothing wrong with letting employees have a little fun.*

DAVID BUTOW

"The problem is that after the office workers left was traditionally when the technicians and creative types got down to serious work — now they commandeer the network to virtually execute each other over and over again. It is hard to determine whether this catalyzes the creative process or merely burns time," he says.

Knight also points out that with all of the attention and resources being focused on network control and policy management, network managers should specifically monitor game-related activities so they know if game playing is getting out of hand.

Dr. Tessa Warschaw, a Los Angeles-based psychotherapist who specializes in corporate negotiation, has a somewhat different perspective. "I advocate playing games. They can be used as a relaxing break to depressurize and as a way of developing corporate culture," she says.

The way in which game playing affects the organization depends on management's trust in its staff, the staff's judgement and the appropriateness of both the game itself and the time and place it occurs, Warschaw says. The size of the company also heavily influences the way game playing is perceived.

"CEOs in small companies tend to exert more control than in large companies and tend to be less tolerant of what they see as nonproductive behavior," Warschaw says.

"Management and staff need to buy into a definition of acceptable conduct in game playing as in any other aspect of individual conduct," she says.

So while computer games can have a positive impact on your corporation, you should set standards and let staff know what's acceptable and what's not. You might also make it known whether it's acceptable to chainsaw the boss.

Gibbs is a writer, contributing editor and columnist to Network World, *and a consultant who has never managed to stay alive in a game of Doom for more than a few minutes. He can be contacted at mgibbs@gibbs.com.*

HOW TO MAKE SURE EVERYONE PLAYS NICELY

- Set a corporate policy that covers appropriate games, playing times and behavior consistent with the desired work environment.
- Monitor network activity to ensure game playing isn't occurring when it shouldn't be.
- Encourage teamwork and cooperation and have the "techies" teach other employees how to play the game.
- Be mindful of staff sensibilities. Some employees might find the likes of Doom and Quake offensive and disturbing.

AVOIDING BLOODSHED

Unquestionably, violent games such as Doom and Quake are the mainstay of network games while solitaire, the ubiquitous Windows card game, takes the single-user prize. While solitaire is innocuous, Doom and Quake are not for everyone – many people will find the violence distasteful.

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July 6	The games IT plays at work	June 30
July 13	How global company's deal with terrorism	July 1
July 20	Measuring ROI:	July 8
July 27	Women-owned net businesses:	July 15

AUGUST		AD CLOSE
Aug. 3	Spotlight on IT jobs in Spokane region	July 22
Aug. 10	Educating non-techie bosses	July 29
Aug. 17	Striking out on your own	Aug 5
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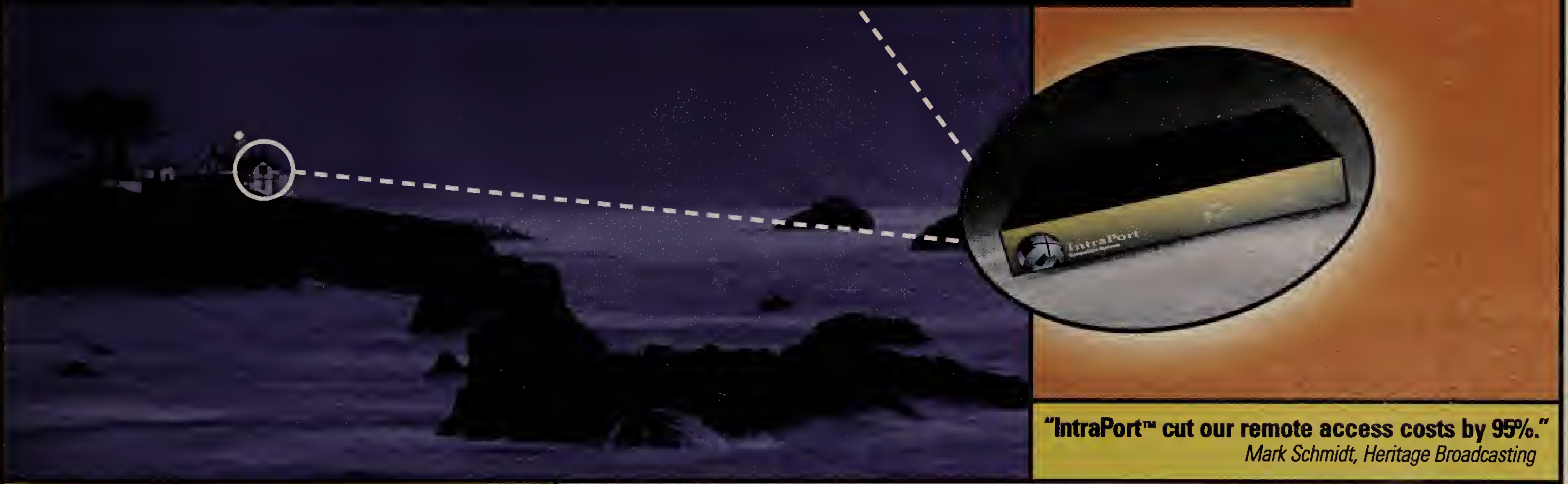

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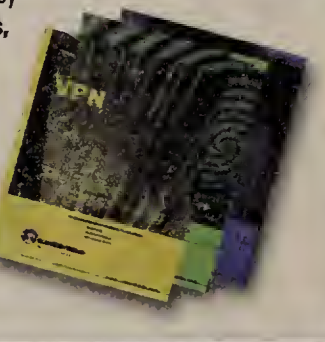

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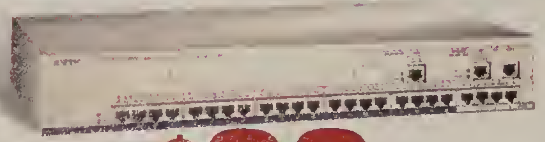

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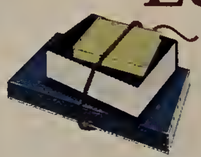

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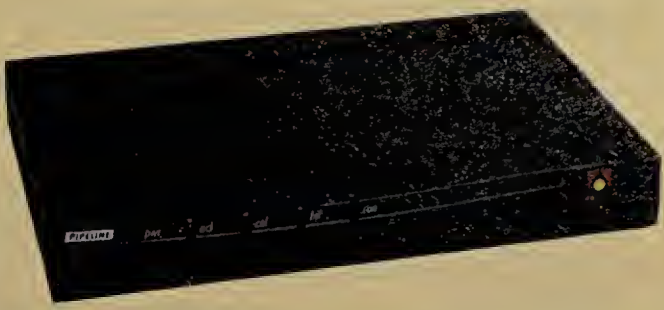

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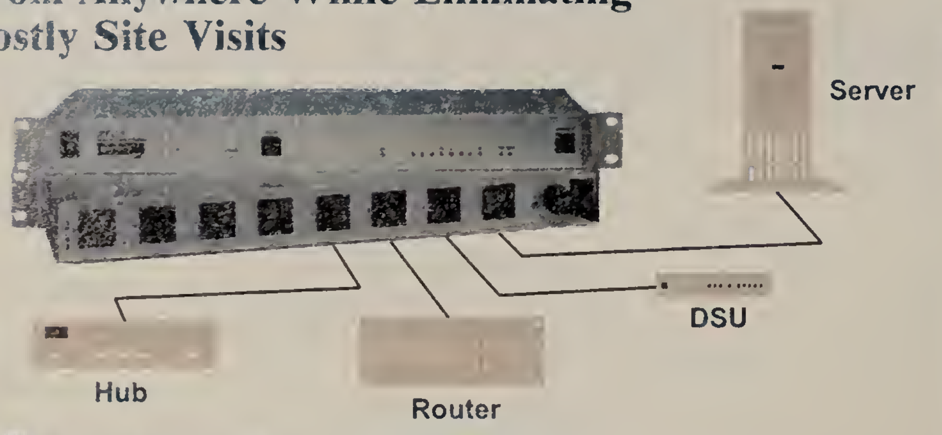

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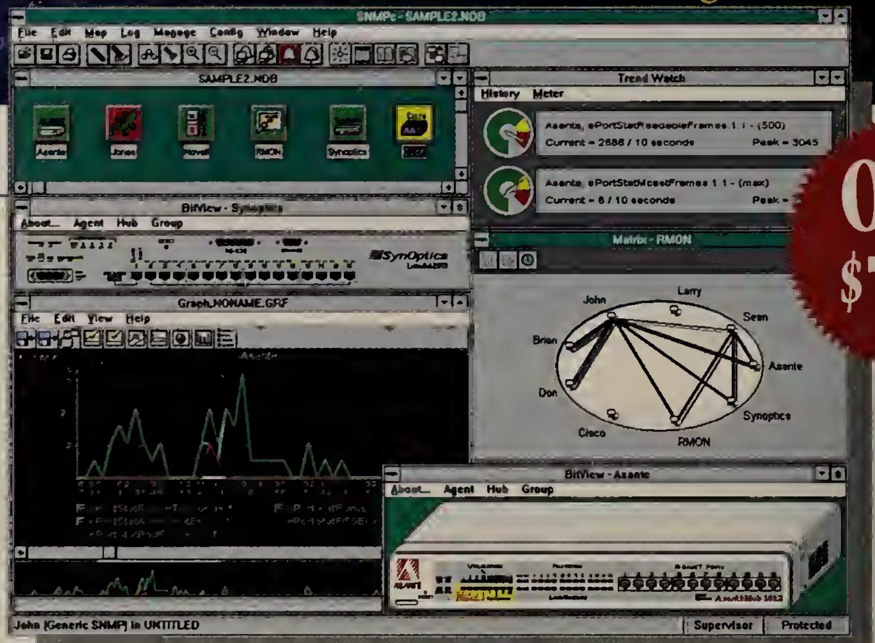

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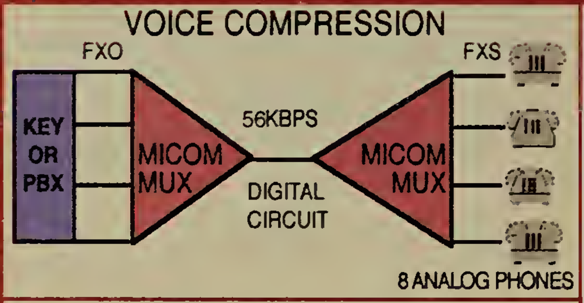

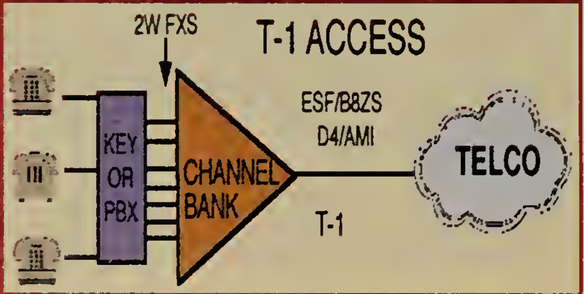

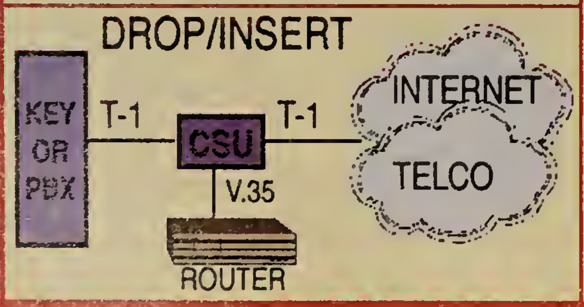

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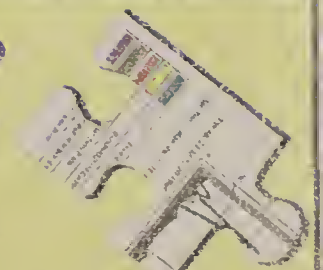

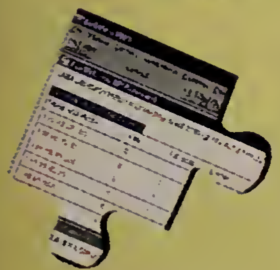

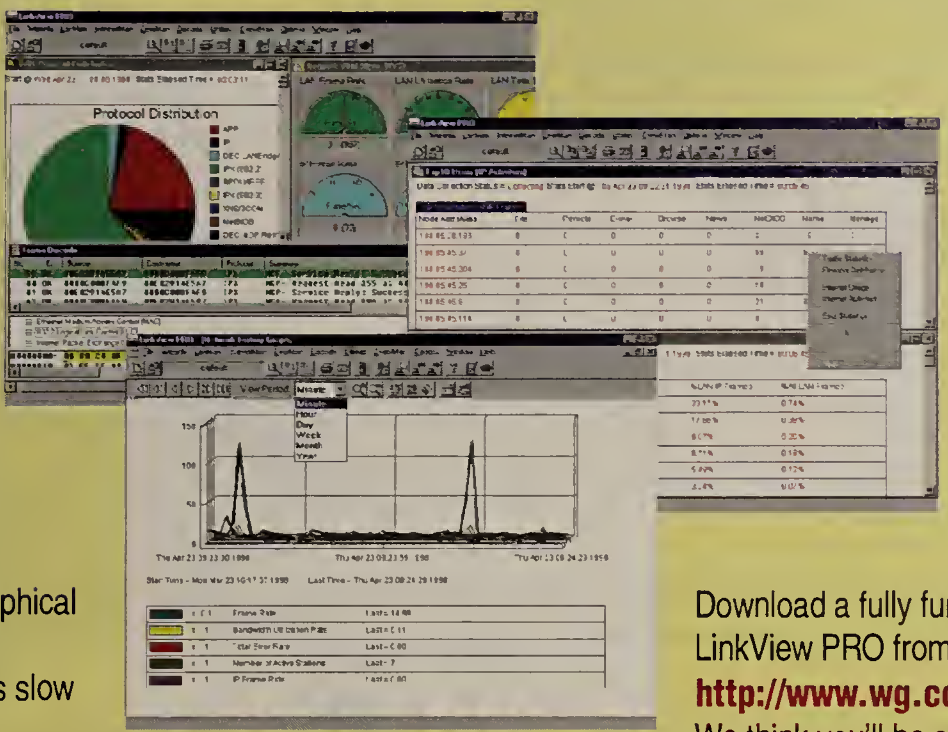

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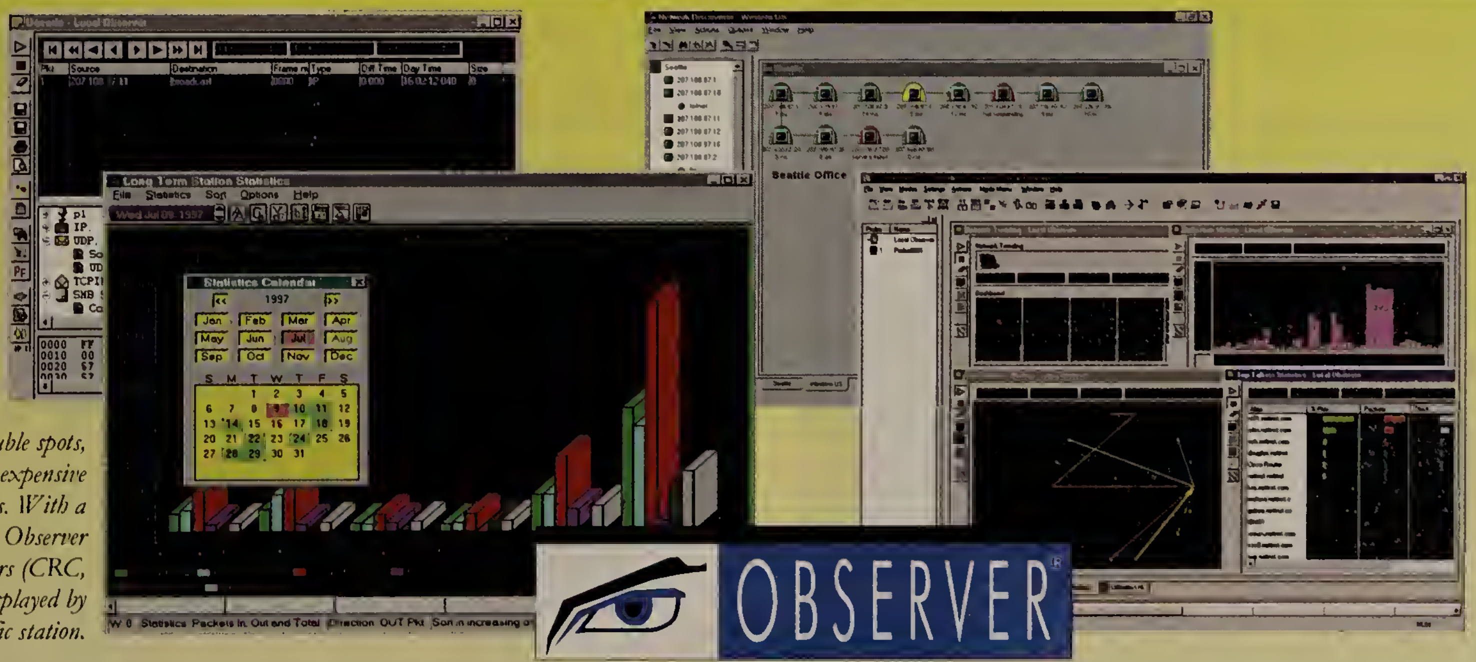

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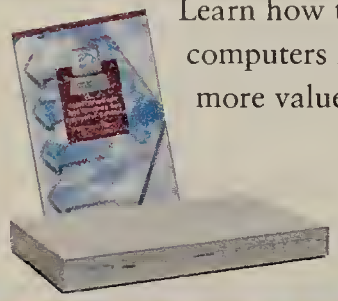

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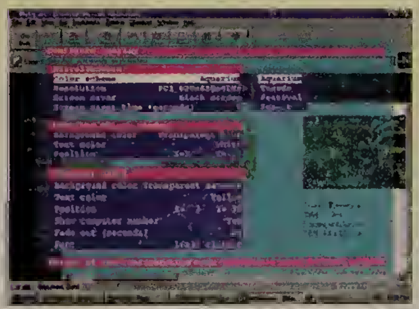

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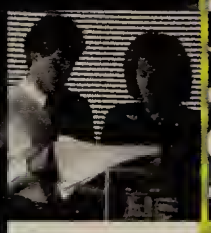

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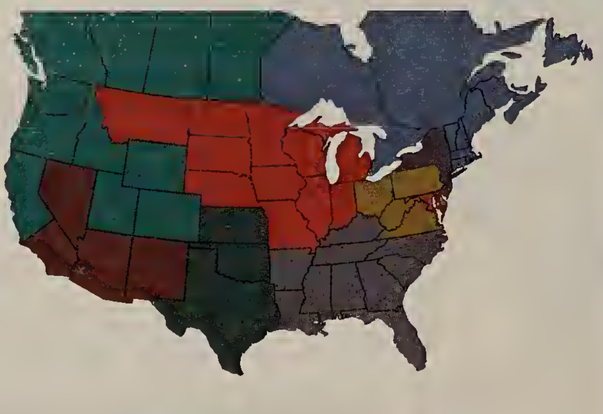

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IP fax

Continued from page 1

IP UPDATE

tion becomes virtually free if customers buy their own Internet fax gear and the offices involved already have Internet connections.

While domestic savings are lower, some IP-based fax products can be configured to use least-cost routing to take advantage of low evening telephone rates as well as IP networking. And IP faxing can pave the way for services such as fax-to-e-mail and e-mail-to-fax conversions.

Fax over the Internet is gaining so much attention that by 2004 it is projected to account for 28% of all fax traffic. But for now, Internet faxing barely exists statistically, accounting for only 22 million pages of the 369 billion pages sent last year, according to fax analyst Maury Kaufman of The Kaufman Group.

TPI Aviation, Ltd. in Dallas uses IP faxing, but the company came upon it almost accidentally when it realized its long-distance phone bills were skyrocketing. An analysis showed a major portion of the cost was for faxing price quotes to the company's international customers.

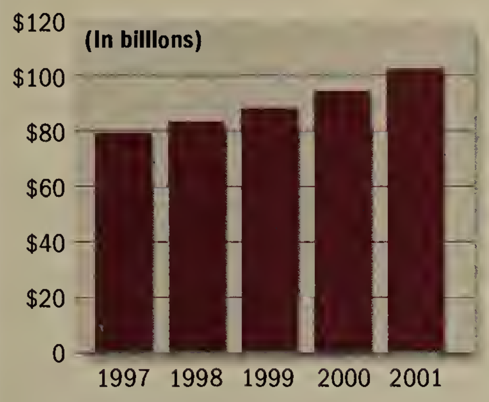
At about the same time, TPI heard about PSINet's Internet Paper IP fax service and signed up. Now, for a flat monthly fee, the company buys a block of faxing time from PSINet. The company has yet to exceed the limit, according to Corie Austin, TPI's network administrator.

The cost savings are significant, Austin said, but she wouldn't say exactly how much TPI is saving.

Fortune 500 and mid-size companies spend an average of $15 million per year on fax phone bills, according to a survey by The Gallup Organization funded by fax equipment maker Pitney Bowes, Inc.

THE FAX BILL

Despite the popularity of e-mail, money spent on phone lines for faxing will continue to grow.



SOURCE: IDC, FRAMINGHAM, MASS.

How it works

With PSINet's service, users load fax server software on a Windows NT server and connect it to PSINet's backbone. When a fax is transmitted, a network server looks up the IP address of the PSINet node closest to the destination fax, routes the fax accordingly and then delivers it over the public switched network. The customer gets a confirmation when the fax is received.

Some service providers charge 15 cents per page within the U.S., making it unattractive for corporations paying 6 cents per minute for long-distance calls. But prices are more attractive internationally. For example, FaxSav, Inc. charges 30 cents to fax a page to Australia and 35 cents to Germany, less than the per-minute charge to either country.

You don't have to use service providers, of course. You can roll your own by installing Internet fax servers at each site.

That's becoming increasingly popular, according to suppliers of Internet fax gear. Jim Jonez, vice president of marketing for RightFax, Inc. in Phoenix, said business is increasing 100% per year.

The fax server model has other benefits, according to Rudolph Martin, owner of Bear Analytics, Inc., a financial research firm in Burlington, Mass. Bear uses an Internet fax server to distribute surveys, allowing the company to multicast forms quickly in a format respondents like.

"My alternative was to have a lot of bodies running to a fax machine. It was labor-intensive," Martin said.

Traffic reporting done by the server helps him track which surveys have been returned and which are outstanding.

While you might think fax traffic would be declining as e-mail takes off, both are increasing in popularity, according to Peter Davidson, an analyst for International Data Corp. Many businesses around the world do not have e-mail, and fax is the only alternative, he said.

With the growing popularity of IP fax, Davidson said he expects major carriers such as AT&T, MCI Communications Corp. and Sprint Corp. to enter the IP fax market in the next few years, just before the market booms. ■

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Voice over IP

Continued from page 1

IP UPDATE

Businesses that routinely communicate with clients or remote sites in other countries are some of the earliest adopters of Internet telephony. This is primarily because international calls carry the most expensive per-minute rates. By encapsulating voice traffic into IP packets, users can send their voice calls over the Internet or an intranet, saving some companies thousands of dollars each month.

For example, Universal Sewing Supply, Inc. is saving $2,300 per month on international long-distance fees since the company deployed two VocalTec Communications, Ltd. IP telephony gateways.

With a gateway at Universal Sewing's headquarters in St. Louis and another at its Santo Domingo, Dominican Republic, site, the industrial sewing equipment manufacturer is sending all of its intracompany voice and fax traffic over the Internet, said Curt Geiler, technical systems administrator at Universal Sewing.

"We are at the mercy of the public Internet and latency does sometimes cause choppiness, but for the most part it's pretty reliable," Geiler said.

Although Universal Sewing has found success with voice over IP, many users said they will not make the plunge in the near future.

"The biggest problem [with voice over IP] is the lack of quality and transmission lag times that cause serious delays," said Nick Barraco, director of information services at Petri, Inc., an automotive steering-wheel manufacturer in Port Huron, Mich. Therefore, there is no business application for the technology, he said. "Sometimes it's easier to have Ma Bell handle things."

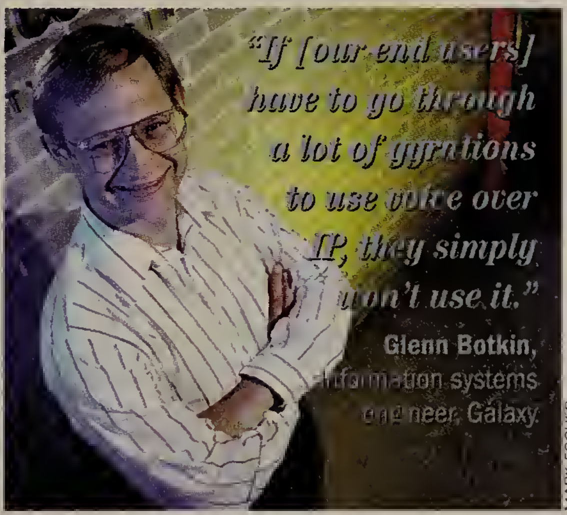
Analysts agree, but are quick to point out that there are other options. In a private IP network, users can get better reliability. "You can get pretty reasonable quality with voice over a private IP network, but the second you go over the Internet the quality goes way down," said Dan Merriman, a vice president at Giga Information Group, Inc., a Cambridge, Mass.-based consultancy.

It's critical that business users understand there is no way to control their traffic today over the Internet, Merriman said. Time-sensitive traffic, such as voice, will suffer. That said, some small to mid-size businesses that are particularly price-sensitive will deal with the latency and jitter to save on monthly long-distance telephone bills, he noted.

But users who find the benefits of voice over IP outweighing the uncertainties of the technology are not easy to come by. Analysts attribute this not only to users' concerns about quality but also to the indecisiveness of industry vendors. Interoperability among gateway vendors is unheard of, even though the International Telecommunication Union H.323 voice-over-IP specification was finalized several months ago.

So instead of committing to deploying the technologies themselves, users are waiting to see what kind of services their carrier may roll out, said Francois-Eric de Repentigny, industry analyst at Frost & Sullivan, a consulting firm based in Mountain View, Calif.

Analysts expect ISPs, competitive access providers, new telecommunication service providers and even traditional long-distance companies to start offering voice-over-IP services within the next two to four years. Some companies, such as Qwest Communications International, Inc. and IDT Corp., already offer limited services. But these are not the services that business users are expected to adopt.


"If [our end users] have to go through a lot of gyrations to use voice over IP, they simply won't use it."
Glenn Botkin, information systems engineer, Galaxy

MARK ESCHER

Instead, the preferred voice-over-IP services will most likely be extensions or added features to existing intranet or virtual private network (VPN) service offerings, de Repentigny said. Carrier voice-over-IP VPN services are also expected to come with service-level agreements, he said.

By choosing a service over a do-it-yourself setup, users will be passing interoperability and upgrade problems on to a service provider.

Galaxy Scientific, Inc. has talked to PSINet, Inc. about being a beta site for the ISP's planned voice-over-IP service, said Glenn Botkin, IS engineer at the Egg Harbor Township, N.J.-based engineering firm.

Galaxy is using an IP-based, fully managed VPN service from PSINet. Adding voice to Galaxy's existing connections to reduce its long-distance telephone costs between sites is tempting, but also daunting.

Rolling out voice over IP internally will require some significant investment in terms of initial procurement, ongoing management and troubleshooting, Botkin said. But if someone else were managing the service, that would be more appealing, he said.

"The potential is there to get into voice over IP, but in order to deploy this technology it has to offer good quality, and it has to be simple to use," Botkin said. "Our people will not accept much degradation, and if they have to go through a lot of gyrations to use voice over IP, they simply won't use it," he said. ■

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Java

Continued from page 1

Solutions Page (java.sun.com/solutions) and find more than 1,500 Java products listed in categories ranging from database connectivity and electronic commerce to network administration and groupware (see graphic). Sun likes what it sees in the list. "Java is moving into just about all areas of software, from map libraries and components through middleware and personal productivity products," said Lew Tucker, director of strategic relations for Sun's Java software division. But questions remain as to the quality, and actual availability, of all this software.

Two of the most prevalent Java application areas today are groupware and database connectivity software. But the largest Java product category is development tools. This is not surprising given that the three-year-old programming language is still primarily in the development phase.

"[Java] is kind of like Unix used to be. Is there going to be a standard, and what company do you pick?

Tod Bryant, director of information systems, New York Life Benefit Services

SHAWN G. HENRY

But even as ISVs continue to unveil enterprise Java products — or sometimes merely product plans — some potential buyers are holding off on purchasing until the vendor picture becomes clearer. "We've got a little bit of Java on our Web site," said Tod Bryant, director of IS for New York Benefit Services, Inc. of Norwood, Mass. "Other than that we haven't made a commitment to it. It's early. It's kind of like Unix used to be. Is there going to be a standard, and what company do you pick?"

For Java ISVs, this kind of prolonged tire-kicking period could spell potential doom, meaning the vendor landscape could be dramatically altered in a matter of months.

And nowhere is this phenomenon more likely than in the tools arena, analysts said.

"The market will be able to sustain no more than about 60% of the current Java tool vendors," said Joseph Feiman, a research director at Gartner Group, Inc. in Stamford, Conn. "I warn my customers to be careful selecting a tool vendor. In two years the vendor might cease to exist, and their customers won't be able to get support for the tool they purchased today."

One good example is NetDynamics, Inc., a former leader in the applications server and tools market. Sun last Thursday announced it was purchasing the company, which will put Sun directly in competition with vendors such as WebLogic, Inc., Novera Software, Inc. and SilverStream Software, Inc. It's not likely that more than a handful of the server/tools vendors will survive against Sun and Netscape Communications Corp., which last year bought applications server start-up Kiva Software, Inc.

Not everyone thinks Java's popularity among developers and the hype generated by Sun and Java ISVs translate into real software. Feiman, for his part, said the number of products listed on the Sun Web site is vastly inflated. "There are not too many ready-to-use Java applications on the market," he said.

And an investment banker said that those who rush to embrace Java now do so at their own peril.

"There are companies completely based on Java that are finding out pretty quickly that they need to tie into the real world and that there aren't as many Java applications as people might have imagined there would be by now," said Christina Morgan, managing director of Hambrecht & Quist in San Francisco.

Indeed, a random sampling of vendors listing products on the Sun Web site reveals that many simply aren't available to customers today.

One start-up, Business Evolution, Inc. of Princeton, N.J., lists a product called InteractPro, a collaboration server designed to allow users to connect, chat and collaborate in real-time and asynchronously. The company tells potential customers that the product can be used within an intranet, extranet or the Internet.

But InteractPro no longer exists, a company official said.

On the other hand, you'll have better luck if you want to write a check for 1PnetWATCHER 1.0 Java Edition, a network monitoring product sold by Avesta Technologies, Inc., also based in New York. The $5,000 monitoring software, developed by Caravelle, Inc. of Ottawa, began shipping in January. (Avesta purchased Caravelle in March.)

And even if a product does exist, there's no guarantee that customers will find out about it. Other than Sun's Web site for Java ISVs and the www.developer.com Web site, there are almost no centralized information and purchasing centers for Java products.

"The channels for Java-specific products haven't really been developed or refined yet," Tucker said.

"It's the traditional reseller channels that are dealing with a lot of these products. So there isn't one place to go to buy Java products," he said.

Java Lobby founder Rick Ross said his organization is considering filling that void by launching a Java Lobby product store Web site. "We're hoping to make it the single place where customers can go when they're looking for Java products," he said. "It hasn't really been done by anybody else." ■

The Java Product Landscape

The largest single category of Java software products remains development tools, underscoring the programming language's relative immaturity.

Java Products	Jan. 1998	June 1998
Development tools	269	357
Productivity/groupware	111	146
Database connectivity	100	139
Authoring tools	68	93
Network/system admin.	59	84
Financial services	55	82
Electronic commerce	47	80
UI elements	48	70
Web servers	50	63

SOURCE: SUN MICROSYSTEMS, PALO ALTO, CALIF.

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Andreessen: "Java situation is grim on the client"

Netscape Communications Corp. — once one of Java's biggest backers — has had a serious change of heart about the technology over the past four or five months, according to company co-founder Marc Andreessen.

He said Java's failure to do the job on network clients is largely behind Netscape's "abrupt" change in direction regarding the technology.

"The Java situation is pretty grim on the client side right now," said Andreessen, who is Netscape's executive vice president for products. He made his comments at Enterprise Outlook, a conference in Burlingame, Calif. designed to bring software start-ups together with investors.

Andreessen says *Java doesn't perform or scale well.*

Andreessen said the technology has come up short on performance, cross-platform compatibility and scalability.

One earlier indication that Netscape was losing its enthusiasm for Java on the client side was the company's abandonment of the Javagator, a Java browser being crafted in partnership with Sun Microsystems, Inc.

Netscape hasn't totally given up on Java, however. Andreessen has been encouraged by technologies such as Javascript and dynamic HTML that enable companies to build solid server-side Java programs.

"On the server side, Java is taking off quite quickly," Andreessen said.

He did warn start-ups to be careful, given that Sun and others are likely to compete vigorously in this market.

Andreessen also treated audience members to his thoughts on a variety of non-Java topics. Here's a sampling:

- The biggest change yet to come to the Internet will be when end users start using normal voice as their main interface to the 'Net. He expects this will start happening in the next three to five years.
- Expect Netscape to continue to buy small companies.

But Andreessen noted that more and more of the start-ups he investigates are thin on management teams and solid product ideas.

— *Bob Brown*

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Juniper breaks its silence with router OS rollout

JUNOS system designed for scale, reliability; software key to unseating Cisco in Internet core.

By Jim Duffy
Mountain View, Calif.

Router start-up Juniper Networks, Inc. last week unveiled the operating system for its forthcoming Internet backbone router, which it expects will help the company infiltrate Cisco Systems, Inc.'s vast installed base.

Juniper, which has been the most closely watched of the high-speed router start-ups because of its funding and investors — $62 million from the likes of Lucent Technologies, Inc., Nortel and 3Com Corp. — has also been the most tight-lipped about its product development.

Juniper tipped its hand ever so slightly by detailing its JUNOS operating system. Rather than being a delivery vehicle for differentiated classes of Internet service, the JUNOS software is designed to help scale the Internet via traffic engineering and to provide predictable service through software reliability, said Joe Furgerson, Juniper's director of marketing.

For end users, this translates into increased uptime and more consistent service, Furgerson said. Juniper users concur.

"It dramatically increases our confidence that we will have access to the technology to keep scaling along with what the demands on the network are," said Michael O'Dell, vice president and chief scientist at UUNET Technologies, Inc. "We can keep [the 'Net] running. That's the important part of this."

More than very fast routing and switching hardware, which most start-ups have been highlighting, software will be the key enabler of Internet performance and reliability. And software will be the way to gain entry into Cisco's vice grip on the Internet core, Furgerson said.

"In entering this market, you've got to answer the question about why one vendor has 85% to 90% of the market. We think it is the special complexity and special implications of software in the Internet core," Furgerson said. "Unless you essentially get on the back of the bull, you never catch up. You've got to get your software base qualified first."

Juniper believes JUNOS will be a strong competitor against Cisco's installed base. For traffic engineering, the software features the Internet Engineering Task Force's Multiprotocol Label Switching (MPLS) specification for mapping IP packets and flows onto frame relay or ATM virtual circuits. MPLS helps ISPs manage growth and provides a foundation on which other value-added services — such as differentiated classes of service and virtual private networks — can be offered over the Internet backbone, Juniper said.

For reliability, JUNOS is based on a modular software architecture with separate programs running in protected memory space on top of a Unix kernel. This approach improves reliability by ensuring that modifications made to one software module have no unwanted side effects on other sections of the software, Juniper asserts. Monolithic, nonmodular operating systems that do not run in protected memory are prone to systemwide failure, Juniper said.

For added reliability, JUNOS brings a number of features, including configuration and monitoring tools, to avoid user error that leads to network downtime. JUNOS allows users to test complex changes before applying them to a live environment. JUNOS has been rigorously tested by four ISPs, @Home Networks, MCI Communications Corp., UUNET and Verio, Inc., and telecommunications equipment provider, L.M. Ericsson.

JUNOS will debut later this year with Juniper's Internet backbone router. As usual, Juniper was mum on router details. ■

HIGH-POWERED SOFTWARE

JUNOS features include:

- A design specifically geared for high-growth Internet backbone
- A modular design that facilitates growth and the rapid introduction of new features
- Configuration management features designed for high-capacity environments
- Traffic engineering tools for network optimization and control

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License

Continued from page 1

But the problem is every single user who wants to access TSE applications must pay for a $269 Windows NT 4.0 Workstation license and a $39 Client Access License (CAL). If you want to let business partners, customers or other "anonymous users," access your TSE applications over the Internet, you'll have to pay these fees for each person.

That could add up to a ton of money. Even based on discounted fees, adding 100 Internet users is $26,900; adding 1,000 users is $269,900. And you will also need Citrix Systems, Inc.'s MetaFrame tool to make it all work, although this software is priced concurrently. That means 100 different users could access TSE with, perhaps, 25 MetaFrame licenses, depending on how often and how long they access it. MetaFrame's suggested retail price for 15 users is $4,995.

"If you have to run your application as an NT 4.0 application, this licensing can become a big issue," said Bill Botti, president of Computer Networks, Inc., a Pleasanton, Calif., systems integrator specializing in Windows thin-client networks. "You'll have to pay a huge amount of money."

Although money is an issue, what really gets some MIS managers worked up is a licensing approach that seems jarringly at odds with the ease of access that's a hallmark of the World Wide Web. "We give out client access [to TSE servers] to users on our network," said Roy Patterson, coordinator for new technology products at Shell Canada, Ltd. in Calgary, Alberta. "But if they later dial in from home working through a Web browser, this is a technical violation of the license. To let these users do that, you have to add still more licenses [for the home-based PCs]."

The situation is not just expensive but complicated as well. "[Microsoft Corp.] should make this a lot easier for us to deal with," Patterson said. "Microsoft today has no means and no tools to help a manager achieve compliance."

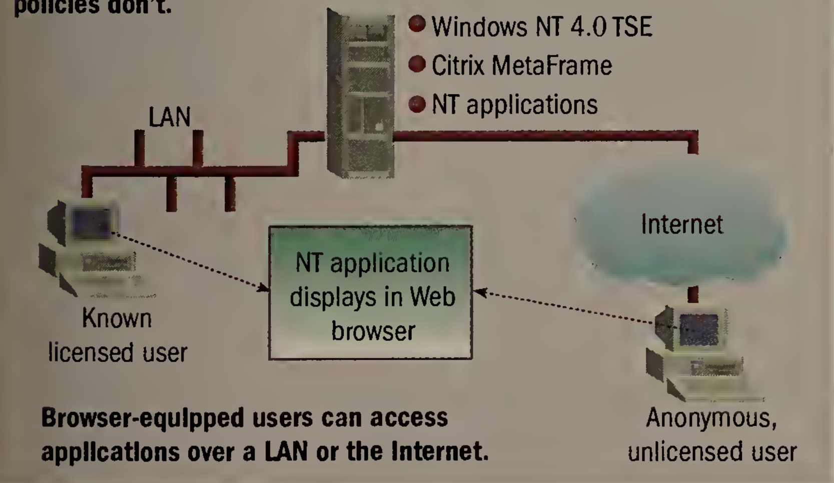
Microsoft agrees there's a problem.

"We absolutely see the need for some kind of Internet commercial use license for Terminal Server — for applications where customers are using it to publish applications," said John Frederiksen, TSE program manager. "In those cases, tracking [TSE] on a per-user basis doesn't make sense."

But Frederiksen gave no hint as to when such an Internet licensing scheme would be available. "We'll come up with a policy that's consistent across all the Microsoft server products, such as SQL Server, regular NT Server and Exchange Server," he said. "I can't commit to a timeline on this, but we've been discussing it since the spring [of 1998]." Currently, Microsoft has no consistent Internet licensing policy. ■

Thin-client snafu

Microsoft's NT Server 4.0 Terminal Server Edition (TSE) lets users access software from a browser. Unfortunately, Microsoft's licensing policies don't.



Browser-equipped users can access applications over a LAN or the Internet.

Argon has a node for scaling

Juniper Networks, Inc.'s software announcement came a week after another start-up unveiled its family of products for scaling the Internet.

Argon Networks, Inc. rolled out the GigaPacket Node (GPN), a line of IP/ATM router products that starts with 20G bit/sec capacity and scales up to 160G bit/sec in 20G bit/sec increments.

The GPN port count scales from eight OC-48s on the 20G bit/sec platform to 64 OC-48s on the 160G bit/sec configuration. The GPN also supports 384 to 3,072 DS-3/E-3 ports, 128 to 1,024 OC-3s and 32 to 256 OC-12s on the 20G bit/sec and 160G bit/sec platforms, respectively.

IP forwarding and ATM switching decisions are performed by an Argon-designed Application Specific Integrated Circuit on the each linecard. The full route table for the IP forwarding or ATM switching decision is local to the linecard and does not employ caching to a centralized route table.

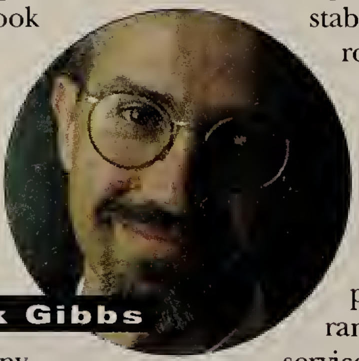
The GPN forwards streams of back-to-back 40-byte IP packets on OC-48 links without packet loss, Argon claims.

With pricing starting at $100,000, Argon's GPN will be in beta test sites in the fourth quarter.

— Jim Duffy

Backspin

Just give me an invisible net


Mark Gibbs

I was just talking to Bob Patterson of Union Switch & Signal (the lucky winner of the "Win Gibbs for a Day" contest) and the topic turned to that old favorite, network management.

Bob said his company had looked at CA Unicenter and concluded it wasn't for them. He said part of the problem was that it took six months to pry the pricing out of Computer Associates. Worse still, when they got the pricing they found it was an extremely complicated tiered scheme based on which processors you use and how many copies you purchase. And if you purchase more units later, you go back to the bottom of the pricing model.

On top of that, Computer Associates wanted Union Switch to work only through consultants and third-party value-added resellers and wouldn't supply any test software. Bob said, "It was like they were doing everything possible to make it as unpleasant as it could be." Well, Bob, there's a great example of marketing gone awry.

But hold hard! I wonder if the reason the process isn't easy is that the product itself isn't easy. CA Unicenter is a complex monster and, much like many other system products, purchasing is only the beginning of the costs. With a network management product of any kind you've got the costs of planning and rollout, followed by the ongoing costs of just running the tool.

And herein lies the nub, the throbbing heart, of this week's missive: Network management is ultimately impossible. Network infrastructure needs to change.

Given the complexity of the average network — routers, switches, hubs, coffee machines, toasters and all of the other appurtenances — most of your bandwidth is devoted to management traffic. So, the reality is you only ever get to manage part of the network — that is, if you actually want to get any work done.

But worse than the bandwidth required is the problem that the accumulation of changes to any given network infrastructure guarantees that it will become unstable. Stability, size and time are, at best, directly and linearly related.

<digression> Talking of stability, I keep reading how robust Windows NT is. Surely robust means that it doesn't break and that it can be fixed. Well, I have a Windows NT 4.0 machine on which I have installed perhaps 100 applications ranging from encryption services to decision-making tools to top-end graphics applications. My problem is that for no apparent reason the damn system frequently slows to a crawl. Processor utilization soars to 100% and half the time the desktop crashes. So, the next time someone suggests that NT is robust, just have him drop me a note. I'll set him straight. <digression>

What we need are invisible networks. I see network infrastructure of the future becoming a mesh of connections and you, as a network manager, won't care what cables run where. The connected computers will have two or more network ports, and they will dynamically select which port to use depending on availability and network loading as well as task priority and user privilege.

The corporate mesh will be self-diagnosing, self-healing and self-optimizing. You will be able to ignore the network infrastructure until something goes wrong. Then when that something stops working, you'll receive a nice e-mail message from some device saying "X happened, I fixed it with Y, you need to replace Z."

Until that day, network managers like Bob will find themselves trying to deal with the likes of Computer Associates.

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'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

'SORRY LUV, 'NUTHER LATE NIGHT AT THE LAB' If only **Benny Hill** were alive today.

You remember Hill, don't you? He was the lowbrow British comic whose shtick was to surround himself with so many busty, scantily clad women we thought he was running a vendor's booth at **Vegas Interop.**

Hill would have been perfect as the ringleader of the Internet porn scandal that has rocked **Britain's Ministry of Defence (MoD)** and stirred debate in Parliament about security vulnerabilities.

The fun began when military investigators conducting a routine security check of the **Defence Evaluation and Research Agency** in Malvern, Worcestershire, discovered about 170,000 pornographic images that had been downloaded from the Internet.

No, that number — 170,000 — is not a typo. In fact, we're pretty sure this represents just about all the porn in cyberspace, though we hear the **Gartner Group** predicts there will be five billion porn images on the 'Net by year 2000.

A research lab staff member and four employees of a company working at the facility have been suspended pending an investigation of the case.

The five Spice Boys had quite an operation going for awhile. MoD officials say the images were gathered over a three-week period. Lab computers were rigged to search out and download porn on a 24-hour-a-day basis.

One computer normally used for communications with colleagues around the world was spending 70% of its online time gathering and disseminating the naughty pictures. (Hey, if a computer can't multitask, what is it good for?)

When they aren't combing cyberspace for porn, the MoD scientists are supposed to be developing battlefield technology for the armed services. Which means it should only be days before **Argentina** demands a **Falkland Islands** rematch.

'Net Buzz has learned that shocked British politicians and military officials vow to examine every piece of evidence in the case.

THE THIN WHITE ISP? From Ziggy Stardust to Aladdin Sane to the Thin White Duke, rock music legend **David Bowie** has been through countless incarnations since his career began in the late '60s.

Starting next month, Bowie can add ISP to his resume. A message on his Web site reveals that the rocker plans to offer his own ISP service, dubbed **BowieNet.**

Bowie says in a message posted on davidbowie.com that the ISP will feature service geared toward music fans. It will include local access numbers for American subscribers, as well as a "davidbowie.com" e-mail address.

The singer, of course, is merely lending his name to the service and taking a cut. The real work will be done by **Concentric Network Corp.** of Cupertino, Calif., which will provide the Internet access, offer technical support and contribute occasional backup vocals.

Bowie intends to charge $19.95 per month for the service and promises that "together we can experience the Internet as never before."

Alas, it appears those cheeky lads at the MoD lab may have beaten him to it.

ATREVE RETRIEVES $8.6 MILLION VENTURE ROUND A start-up that makes applications management software for Web sites has closed an $8.6 million second round of financing from **Cisco** and several venture firms.

Atreve Software, Inc., based in Cambridge, Mass., has now raised $11.6 million since it was founded in 1996.

Cisco and **Morgenthaler Ventures,** along with original investors **Charles River Ventures** and **Bessemer Venture Partners,** funded the latest round.

Atreve's flagship product, WebSpective, is designed to address what company officials call the seven critical needs of Web operations management: traffic management, content distribution, centralized site administration, crisis management, performance monitoring, data collection and analysis, and porn downloading.

Alright, we added that last item, just to achieve some closure.

'Net Buzz seeks your deepest Internet- and intranet-related secrets and not just because we want to take advantage of you (though it's mostly that). Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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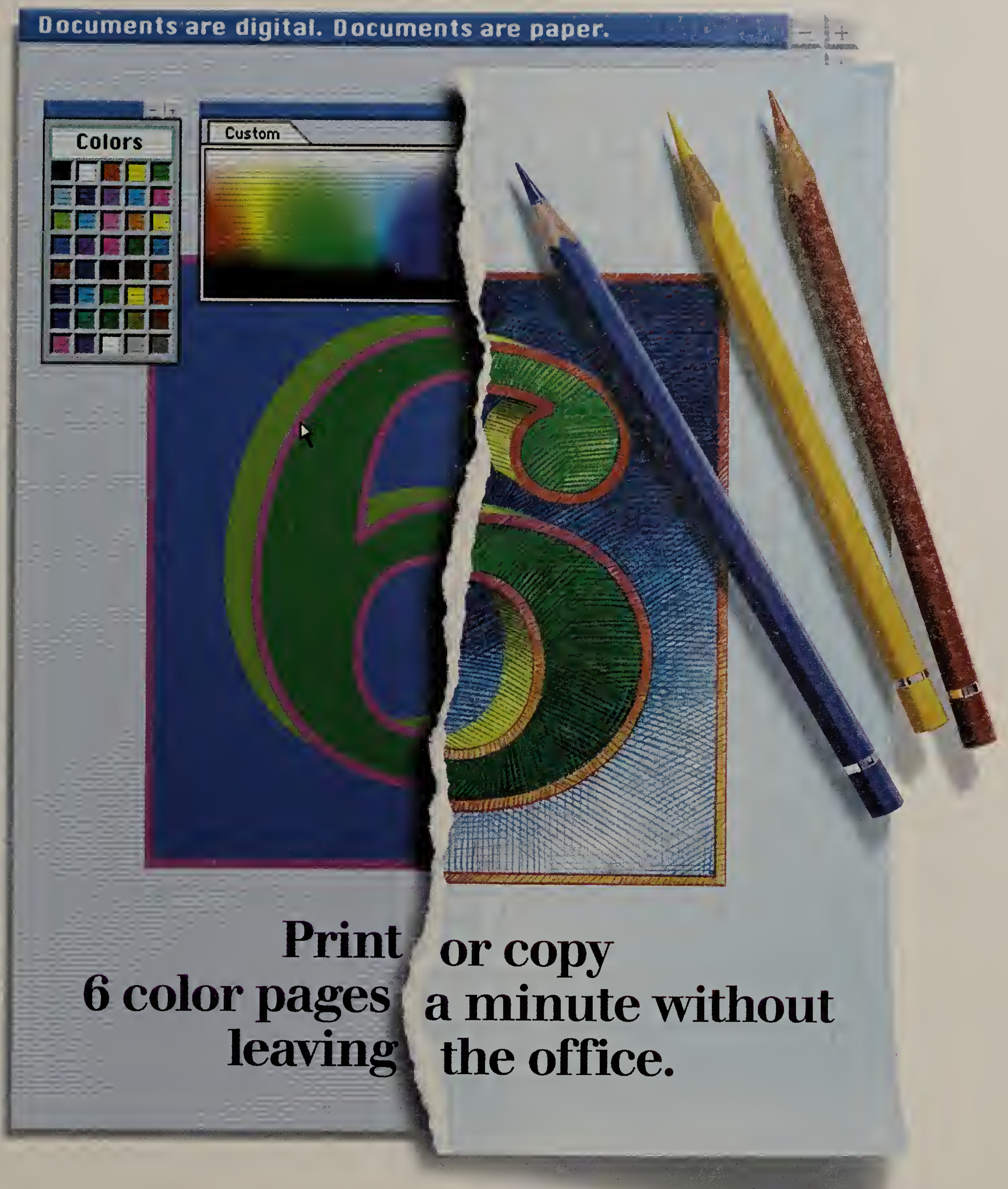
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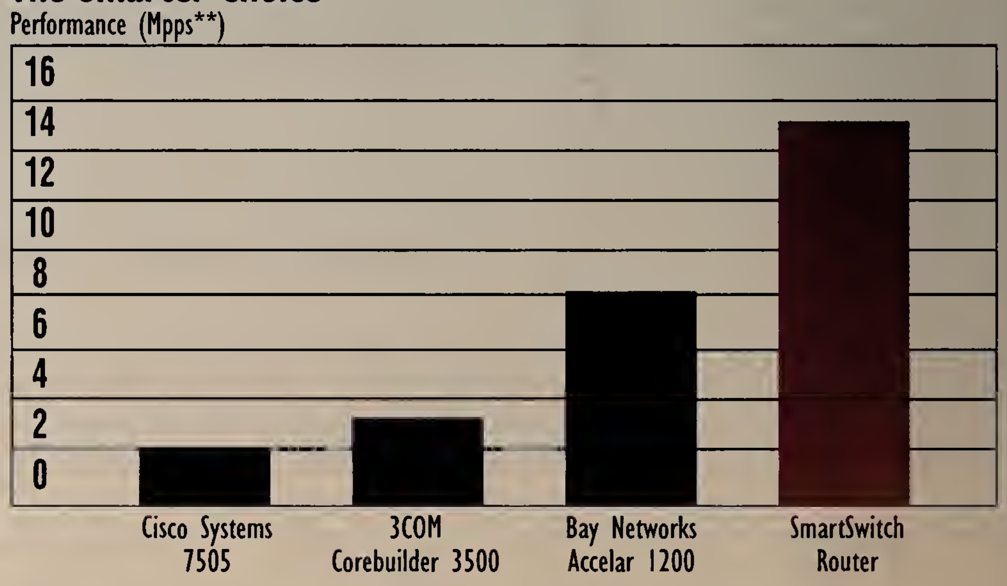

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